1876. 1890

The United States MILLER AND THE MILLING ENGINEER.

Fifteenth Year.—No. 9. MILWAUKEE, SEPTEMBER, 1890. Subscription Price, $1.00 Per Year.

"RUNS LIKE A CLOCK"

WATERTOWN, WIS, July 23d, 1890.

THE EDWARD P. ALLIS COMPANY,

MILWAUKEE, WIS.:

GENTLEMEN—It gives us pleasure to say that our Globe Mill, rebuilt by you and completed and running since June 1st, is giving us splendid satisfaction in every respect. The machinery is well located, and runs like a clock, smooth and easy. The quantity of wheat per bbl. of flour has been considerably lowered, the quality of flour greatly improved, and the mill is doing everything you guaranteed. We hereby acknowledge our acceptance, and shall be pleased at any time to have you refer other parties to us for further particulars regarding the mill in general or any of the machinery.

We remain, yours truly,

THE GLOBE MILLING CO.,

Capacity, 450 Barrels. G. MAY, Secretary

The above mentioned mill is fully equipped with **Gray's Noiseless Belt Roller Mills, Gray's Improved Centrifugal Reels, Gray's Patent Flour Dressers, Reliance Sieve Scalpers and Reliance Purifiers,** arranged upon our latest improved system, with the **BEALL CORRUGATION** on break rolls. The results speak for themselves.

If in want of anything in our line, write for prices.

THE EDW. P. ALLIS COMPANY

* Mill Builders and Mill Furnishers, *

RELIANCE WORKS, MILWAUKEE, WIS.

The United States MILLER AND THE MILLING ENGINEER.

Fifteenth Year.—No. 9. MILWAUKEE, SEPTEMBER, 1890. Subscription Price, $1.00 Per Year.

[Written for the UNITED STATES MILLER AND MILLING ENGINEER.]

MILLING THOUGHTS.

By J. F. MUELLER.

A FLOUR-MILL operative subjects himself to a great many risks while on duty, attending to the machinery in his charge, the majority of accidents however, are probably traceable to some one's neglect or carelessness. Those situations and parts of machinery that one would suppose to be the most fruitful sources of mishaps, are often the freest from them. Thus, for example, we seldom hear of persons being caught in a fly-wheel or in a pair of gears, because the danger from these sources is so well known that every one takes the proper precautions.

The little innocent and apparently inconsequential things are those that do the mischief. One great fault, and one that causes numerous accidents is the manner in which many workmen attempt to put on belts while pulleys are in motion. More people get caught in this way than in any other way. I have seen men on a ladder trying to put on a ten-inch belt, running at high speed, crowding the belt against the pulley, and burning it as well as their hands, and finally having to give it up; then they had the speed slowed and put the belt on without any trouble. There is nothing which agitates one's nervous system more than to see some one attempt to put on a belt while standing on the wrong side of a pulley. He stands no chance of getting the belt on, and a good big chance of being caught and wound around the shaft. The proper plan is to stand on the opposite side of the belt, puting it on as it travels towards you. Having a good foundation to stand on, take the belt in hand and lead on to the pulley, moving the hand as fast as the pulley travels. I have seen a little fellow who understood this principle, go to a large belt that three men were tugging at, and easily put it on the pulley at the first trial.

Pulleys on line and other shafting should never have any set-screws so placed as to be likely to catch the clothing or belts—they should be well under cover and no longer than necessary. In couplings as well as in pulleys keys should not be left to project far beyond the end of the hub, nor set-screws project beyond the surface. They cut nearly as bad as a knife when running at a high speed, because of their exposure. Where face couplings are used, none other than the fanged face couplings covering the bolts should be allowed.

It is always advisable to use a housing or covering for belts wherever they are likely to be dangerous. Do not allow your fingers to get any nearer a pair of rolls on the upper side, particularly when the rolls are corrugated than you can possibly help. A young fellow went into a mill, and not seeing any one about, he went to an elevator carrying up wheat. The elevator door being open he reached in to grab some of the wheat out of the cups as they passed the opening. His hand was caught and one of his fingers terribly mutilated. Just then the miller arrived upon the scene, and seeing him dancing around with his hand all bloody, asked him what he had done, and how he had done it. Advancing to the elevator and attempting to show how he was caught he ran his finger beyond the point of safety and once more came near losing his whole hand. That young man does not attempt to take wheat out of an elevator now while it is in motion. I once heard of a miller throwing a pair of spur gears into gear. One of the spurs was arranged to slide on a feather into the shaft. In the first place he found that he could easily throw the gear apart while in motion. After a while he concluded that he could throw them into gear again. It is needless to say that there was but little left of the gears and the man escaped with a few bruises.

Allow me to give a bit of advice what to do in case you should find a man unfortunate enough to have his finger caught in a pair of rolls. Do not by any means throw the rolls apart, but either stop the engine or throw off the belt. By throwing the rolls apart there is danger of the whole hand being drawn in. I have heard of a case of this kind where a miller lost his entire hand.

The old way of driving bolting chests by means of spur or bevel gearing were very dangerous. This danger has been largely overcome by use of belts and chains of which the former is preferable so far as safety is concerned. But taking it altogether the majority of mills that are being built now-days are safer in the hands of the operative than the mills of former days. There is at least a great deal less gearing used and more precautions are taken in every way.

OUR ST. LOUIS LETTER.

Trouble About Private Wires.—A "Scrap" on 'Change.—An Inter-State Commerce Case.—Receipts, Shipments, Markets, Etc.—Mills.—Personal Notes.

THE month of August has furnished few items of interest to either flour or grain dealers. The usual conflicting reports of the crops and the fluctuations of the market were the most important points, while the removal of the private wires from the Exchange floor attracted some attention. As I reported in my August letter, this ruling of the Board of Directors affected only five brokers — Ewald, Francis, Grier, Green and Nicoll. Of course these five objected strenuously to their decision, but the Board was obdurate, and the wires went. The brokers, however, not to be outdone, have removed their wires just outside of the Exchange hall and not more than fifty feet from their former location. This change has affected them only in that it delayed the quotations some few minutes; but it has, on the other hand, proved no small source of annoyance to the members of the Exchange. The hallway leading from the main entrance to the entrace to the elevators is now blocked during the morning session by a multitude of small boys, with their telegrams, running to and from the trading pit, and it requires no small amount of dexterity to successfully elude this small specie of battering-ram as they dart in and out through the crowd. The brokers are unconcerned about the comfort of the President, Board of Directors and other members of the Exchange, and, as the Board of Directors have not accomplished the end sought by their action, it will not be a surprise if they reconsider the matter.

A recent petition laid before the Directory was one to open the Exchange hall for trading from two to three P. M. At their last meeting the Directors decided to leave it to a vote of the members, not caring to take the responsibility of encouraging gambling, as they consider the "put" and "call" business of the afternoon. While awaiting action on their petition, the curb traders have rented a large hall on the first floor of the Exchange building, and here they make life burdensome to office men in the vicinity. Nor are their actions confined entirely to trading, as was shown in a recent little bout of one round between Moses Fraley & Son and the "art club." Over a transaction made in jest the Fraleys were attacked by several traders, but after a few blows had been struck the police decided to stop the affray, seeing that no permit had been issued for a boxing exhibition, and the affair came to a close, with small damage to the participants. The affair will be a subject of discussion at the next meeting of the Board of Directors.

On Saturday General Veazey, Commander-in-Chief of the G. A. R., held a reception at the Merchants' Exchange. He is here with Mr. William Morrison, as a member of the Inter-State Commerce Commission, to consider the complaint of the Hezel Milling Company, of East St. Louis, against the Illinois Central and Cairo Short Line. Mr. George E. Lary, general freight and passenger agent of the Cairo Short Line, appeared for the railways, while James O. Broadhead and William Hezel supported the milling Company's claim. The complaint is that St. Louis shippers have the same rates as those on the Illinois side, in respect to Southern and Southeastern points, besides having entire cost of transfer from St. Louis to the East Side included in shipment, while the East Side millers must haul their shipments to the depot. The decision on the case will be had as soon as the Washington parties can act on the matter. In regard to grain rates, General Veazey said that they would probably go into effect by October 1, and that the railroads would hardly insist on a rehearing of an action made after due deliberation.

The Merchants' Exchange, in their report for the month of August, gives the wheat receipts as 1,593,350 bushels, as against 1,931,050 of last year. Shipments for the same month were 452,822 bushels, as against 1,487,893 bushels. Corn receipts equaled 1,630,625 bushels, and shipments were 1,715,431 bushels.

In wheat, No. 2 red was fairly active, both on milling and speculative accounts. No. 3 red had a fair demand towards the latter part of the week, while No. 4 was practically ignored.

The following are the quotations for the past week:

	No. 4.	No. 3 Red	No. 2 Red.
Monday	90	94½	98½@97¼
Tuesday	86	92¼@93	95¾@96¾
Wednesday	88	93½@94	96 @97
Thursday	91	97¼	99¾@100½
Friday	90	97	100@100⅝
Saturday	91	97	99@100

Flour receipts for the week were 23,088 barrels, with shipments amounting to 57,751 barrels, making an aggregate for the past month of 113,091 barrels received and 273,945 shipped. Owing to the high prices asked, buyers bought only as necessity demanded. Orders from Southern points came in sparingly. Quotations are: XXX, $2.75@2.85; family, $3.15@3.25; choice, $3.40@3.60; fancy, $4.40@4.50; extra fancy, $4.70@4.80; patent, $5.00@5.20.

Several events of interest to our milling fraternity will take place during the coming month. One is the St. Louis fair, which will open early in October. His Majesty, the Veiled Prophet, has also sent broadcast his decree to the city of St. Louis, which he will visit October 7. The St. Louis Exposition, under the able management of Mr. Frank Gaienne, is now open and attracting well. As usual, milling interests are well represented in the machinery department.

MILL NOTES.

J. H. Bagly, of Randolph, Mo., is building a 950-barrel capacity mill.

The capacity of Winkler & Lupke's mill at Gordonville, Mo., has been increased.

Harry Richmond, of the Richmond Manufacturing Company, has secured contracts with Mr. Servos, of Richmond, Mo., and Mr. Westmann, of Nashville, Ill, to equip their mills with the Richmond machinery.

PERSONAL.

Gov. E. O. Stanard has returned from Oconomowoc, Wis.

President Kauffmann and Louis Fusz are still in Europe, but are expected home soon.

Among the visitors on 'Change were: Messrs. Stephain, of Marissa, Ill.; Pearson, California, Mo.; Huch, Columbia, Ill.; McLean, of the Richmond Manufacturing Company, Lockport, N. Y.; Frank Hill, Carthage, Mo.; Seybt, Highland, Ill.; Fred Tiedemann, Jackson, Mo., and Mr. Holly, of the Holly Manufacturing Company, Lockport, N. Y.

WALTER HOWARD BAIN.

ST. LOUIS, September 15, 1890.

TRADE NOTES.

THE Superlative Purifier Mfg. Co., have just furnished Bran Dusters to S. N. Ingram, Mumford, Mo.; and J. H. Wyman, Bangor, Mich.

THE Superlative Purifier Mfg. Co., of Milwaukee, have just furnished Purifiers to H. J. Young, Greenwich, N. J.; Wm. Wall, Dundee, Ia.; and Novelty Iron Works, Dubuque, Ia.

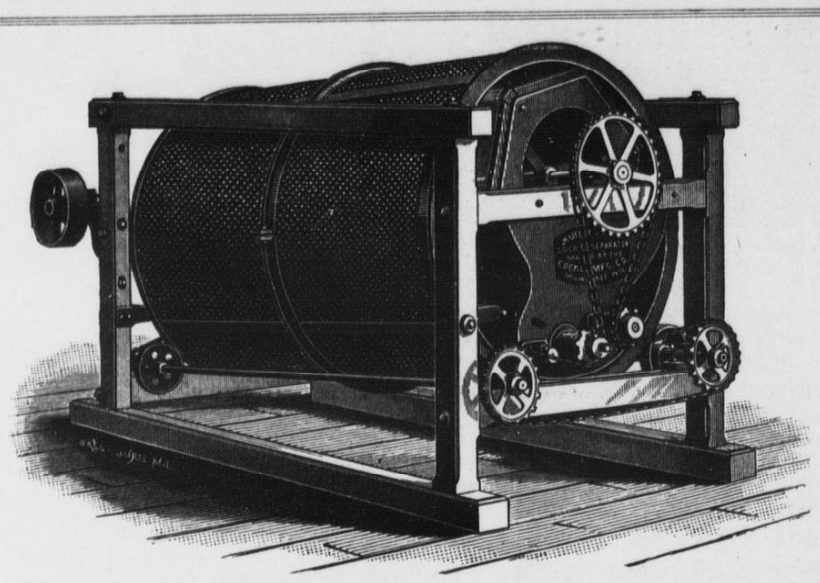
THE Menasha Wood Split Pulley Co. of Minasha, Wis., had orders lately for their Hickory Pulleys from Conkey Bros., Preston, Minn.; The Wm. Rogers Mfg. Co., Hartford, Conn.; and the Minnesota Iron Co., Soudan, Minn.

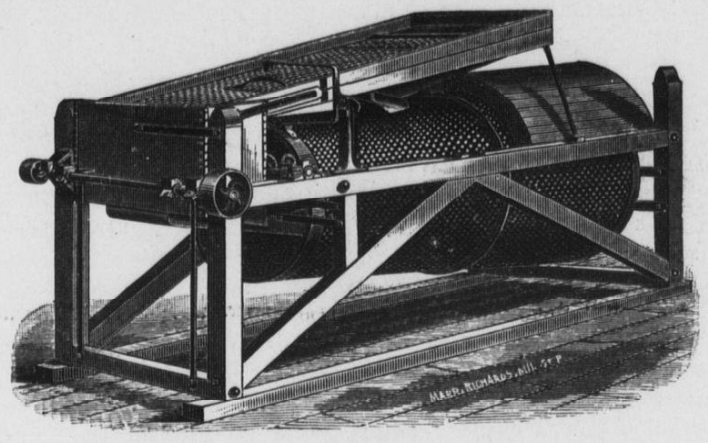
THE Superlative Purifier Mfg. Co., of Milwaukee, have recent orders for New Era Scalpers from J. A. Noggle, Lodi, O., S. N. Ingram, Mumford, Mo.; Daniel Snyder, Newcomerstown, O.; John Short, Vail, Iowa; Troyer & Co., Baltic, Ohio.; Wm. Foresman & Bro., Circleville, O.; Birchard, Bridge & Co., Norfolk, Neb.; Essmueller & Barry, St. Louis, Mo., (two machines); Fred. B. Wolcott, Romeo, Mich.; Nordyke & Marmon Co., Indianapolis, Ind., (4 machines); F. H. Bacon, Brownhelm, O.; Williams, Barrows & Co., Lorain, O.; Heyman & Co., Monroeville, O.; J. E. Burroughs, Flint, Mich.

The Kurth Cockle Separator

THE PIONEER COCKLE SEPARATOR

And the machine that is running and giving satisfaction in thousands of mills in this country. Years of work prove its usefulness and durability.





We are now prepared to furnish these Separators in three styles, with either reel or sieve graders, and also with or without oat separator attachments. We are also prepared to furnish machines of small capacity, suitable for small mills, without any grader, simply the cylinder and catchboard in a simple frame, at low prices

These machines are supplied with **steel cylinders,** if desired. **When you buy, get the best.** It is cheapest in the long run.

FOR CATALOGUES, PRICES, ETC., ADDRESS

COCKLE · SEPARATOR · MFG. · CO.

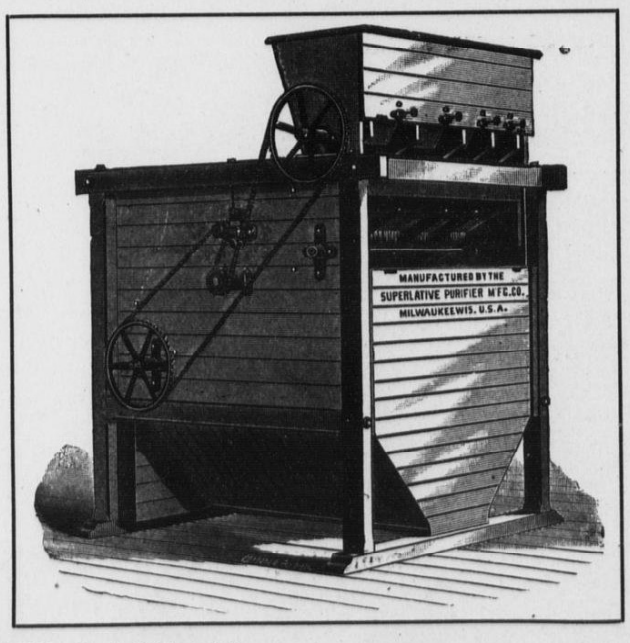
MILWAUKEE, - - WISCONSIN.

THE NEW ERA SCALPER

THE PIONEER SIEVE SCALPER.

Does better work, and more of it, than any other Scalper on the market. Is working successfully in all sections of the country, on all grades of wheat, and is sent under guarantee to give satisfaction or no sale.

Write for circular giving list of millers using this machine, and go and see its work. If you do, you will see that it will be to your advantage to use it. The above circular also contains numerous testimonials, of which we give a couple of samples.



One machine, with sieve 40 inches wide, will handle one break in 500 bbl. mill; two breaks in 200 to 250 bbl. mill, or four breaks in 100 bbl. mill. Two machines can be driven with a 3-inch belt over a 5-inch pulley. Does not scour the bran, giving a clear break flour and an improvement in all grades.

SHEBOYGAN, WIS., April 26th, 1890.

SUPERLATIVE PURIFIER MFG. CO., Milwaukee, Wis.:

Gentlemen—The two New Era Scalpers purchased of you two months since have been running continuously ever since. They have done all you claimed for them, and we would not now be without them. They have made a most remarkable change in the appearance of all stocks in the mill. We heartily recommend them to the milling fraternity.

Very truly yours,

WM. ELWELL & SON.

MIDWAY, PA., August 5th, 1890.

SUPERLATIVE PURIFIER MFG. CO., Milwaukee, Wis.:

Gentlemen—The New Era Scalper bought of you has now been running for about three weeks, with perfect success. As short a time as it has been in operation, I would say that I would not be without one for three times its cost. It has improved the whole product of the mill. It's a grand improvement over the reel scalper; takes only about one-tenth of the horse power, and am satisfied the machine could be run successfully with a 1½-inch belt.

Yours truly,

D. BLACK, miller for ROBBINS & BAMFORD

FOR CATALOGUES, CIRCULARS, ETC., ADDRESS

SUPERLATIVE PURIFIER MFG. CO.

MILWAUKEE. · · WISCONSIN.

ALSO MANUFACTURERS OF

The Superlative Purifier and Superlative Bran Duster.

UNITED STATES MILLER
AND THE MILLING ENGINEER.

E. HARRISON CAWKER, EDITOR.

PUBLISHED MONTHLY.

OFFICE, NO. 124 GRAND AVENUE, MILWAUKEE.
SUBSCRIPTION PRICE—PER YEAR, IN ADVANCE.
To American subscribers, postage prepaid..... $1.00
To Canadian subscribers, postage prepaid..... 1.00
Foreign subscriptions..... 5s.
All Drafts and Post-Office Money Orders must be made payable to E. Harrison Cawker.
Bills for advertising will be sent monthly, unless otherwise agreed upon.
For estimates for advertising, address the UNITED STATES MILLER AND THE MILLING ENGINEER.

[Entered at the Post Office at Milwaukee, Wis., as mail matter of the second-class.]

MILWAUKEE, SEPTEMBER, 1890.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER AND THE MILLING ENGINEER. You will thereby oblige not only this paper, but the advertisers.

WE send out a number of SAMPLE COPIES of each issue. We solicit a critical examination of our Journal and invite you to subscribe. The price is one dollar per year. No premiums—no discount.

SEVEN out of every eight loaves of bread eaten in London are made from imported wheat or flour.

WE will furnish the UNITED STATES MILLER and weekly *Northwestern Miller* for one year for $3.25, or with any monthly milling journal for $1.50.

RUSSIAN millers held a Convention at Odessa recently for the purpose of taking such action as would lead to a heavier export of Russian flour to other European countries.

WE would advise all who like to be "quick at figures" to send to the United States Miller for "100 Lessons in Business," price, post-paid, $1.00.

LAST month we referred to an interesting paper read before the British and Irish Millers' Association, by Mr. A. Steiger, on the subject of "Roller Milling for Small Mills." We take pleasure in publishing it this month.

OUR Buffalo contemporary advertises as follows:

"Oh! Oh! What a combination! The Roller Mill, The American Miller and a steel flour trier, all for $1.50."

Verily, this is tough on the steel flour trier.

THE Mechanical Rubber Goods Manufacturers Association met in NewYork Sept. 5th, and concluded to stretch the prices of their elastic goods to a higher point. The Association should move with caution in this direction, or like rubber it may reach the breaking point.

MILL-OWNERS desiring to reach the dealers in flour, grain and feed in all parts of this country and Europe, should send for "Cawker's American Flour Mill and Grain Elevator Directory for 1890," which contains all desired information. Price $10, postpaid to any address. See adv. on first page.

TO all appearances the labors of the present Congress are of the mountain and mouse order. Many bills of great importance will undoubtedly fail to reach a final vote, among which we may note are the bill repealing the timber culture act, the bill to establish private land claim courts, the bill for the relief of the pressure of business in the U. S. Supreme Court, the bill for the adjustment of claims of laborers etc., the bankruptcy bill, and telegraph bill. There are so many politicians in our National legislature, that it seems very difficult to secure good business results, and there is always a danger that more bad new laws will be made than bad old laws repealed. If some one would introduce a political purifier that would cleanse and purify the grist that goes into the national law hopper, it would have plenty of work to do. As it is, the public breathes easier when Congress has adjourned.

IN answer to many inquiries we desire to say that "Cawker's American Flour Mill and Grain Elevator Directory" is of great value to all merchant millers, for it furnishes the names and address of flour brokers, wholesale flour dealers, prominent bakers, and dealers in grain and millstuffs. It is a *key* to all departments of the trade, and is reliable.

THE *London Daily Graphic* has the following: "Last year the imports of Russian wheat decreased greatly, as compared with that of the preceding year, because of the deficient crop; this year, with every prospect of an excellent crop, there is likely to be still a small export of wheat from Russia, because the rouble has increased so much in value or rather the pound sterling has depreciated so much. Eighteen months ago, says a writer in the *Levant Herald*, the pound was worth at at Odessa twelve roubles and fifty copecks; now it is only worth eight roubles and fifty copecks. The Russian grain houses must therefore either cease to export wheat or face bankruptcy; and of the two evils they have chosen the first. A small import from Russia, in a season when the yield of the American wheat crop is below the average, means for us that we shall be more than we would care at the mercy of the wheat speculators in America next winter."

SCHEMERS STILL AT WORK.

CONSIDERABLE consternation was created recently among exporters by the anouncement that the Treasury Department had issued an edict, that, based upon an opinion given by the Attorney General, in reference to endorsed Bills of Lading, no more drawbacks of duty would be allowed to shippers upon exported merchandise, he contending that when a party endorses a Bill of Lading, all right to drawback is thereby waived, and the consignee may come forward and make claim for the rebate. This ruling was so manifestly unjust and unreasonable, upsetting all previous methods of doing business, that it was not believed by many that the decision could stand. The Millers' National Association having had some experience of late in fighting opposition to drawbacks on burlaps, and being on the watch for "new moves" in this direction adverse to the interests of its members, was quick to take action on this matter, and an appeal was at once made to members of Congress to have it righted. It seems that the opinion referred to, was rendered by the *Solicitor of the Treasury*, and as soon as the attention of the Attorney General was called to the matter, it was reversed, and drawbacks will be paid to the consignor as heretofore.

THE following important circular was issued by the Millers' National Association very recently, and we trust it will meet with the attention it deserves:

Milwaukee, Sept. 13, 1890.

DEAR SIR: On Sept. 6th, at the last moment, when the Senate was acting upon the Tariff Bill, Senator Sherman, of Ohio, offered an amendment as follows:

"That in no case shall drawbacks (on exported merchandise which has been imported into the United States) be allowed *where claim amounts to less than $10.*"

This amendment will prevent from 40 to 50 per cent. of the flour exporters of our country from collecting drawback on burlaps exported around flour, and will amount to thousands of dollars per annum out of the pockets of the smaller millers.

It means that the rebate on exported burlap sacks will be given only to *large shippers*, and the smaller importer must pay about 25 per cent. more for his bags, unless he can buy them of the American jute manufacturers for less, which is, of course, improbable. It tends to benefit the larger manufacturer, sacrificing the smaller, poorer one, and is an outrage upon the milling industry of the country. After the efforts of the Millers' National Association to make this subject clear to our National legislators and our appeals for justice when this amendment was reported, the action of the Senate cannot be attributed to ignorance of facts. It is manifestly in the interest of the "Jute Combine," which, as you have heretofore been advised, has been using every effort to obtain a monopoly for their goods, through the medium of this tariff measure. The bill now goes to a Conference Committee, composed of seven Senators and seven Members of the House of Representatives, for final revision. The action of this Committee will be final, and when adopted by Senate and House and signed by the President, becomes law. We have one hope for justice, and that is to bring such pressure to bear upon this Conference Committee, that the above provision shall be amended.

To this end would earnestly request that you immediately upon receipt of this circular communicate with your Congressional Representatives, both in Senate and House, urging, in the most emphatic manner possible, that every effort be used by them *to secure amendment in Conference Committee, striking out the $10 drawback limit on exported merchandise, as per amendment by Sherman on September 6th.* A telegram, followed by letters, will have the best effect.

Please do not leave this to "the rest" but act *yourself*, quickly. Concerted protest on the part of *all* members is needed.

Respectfully,
FRANK BARRY, *Secretary.*

THE MODERN IDEA.

Do unto others as they do unto you. A Letter from Sec'y James G. Blaine on Reciprocity.

IN a letter to the editor of *The Boston Journal*, dated Boston, September 16, in response to an invitation to attend the annual banquet of the Boot and Shoe Club, the Hon. James G. Blaine regrets that his engagements will not permit it. He is glad the club is interested in a system of reciprocal trade with Latin America. They can do great good by counteracting a New England opinion, that New England is not to receive, in the new tariff, the amplest protection for every manufacturing industry, and it will, in his judgment, be both inexpedient and injurious for her representatives to disregard a measure which will promote Western interests.

"I have lately received a letter from Mr. J. F. Imbs, of St. Louis, a representative of the flour interests. He says that 'advices of recent date from Cuba state the duties now collected on American flour are at a higher rate than was at first supposed.' And he adds: 'I respectfully submit that the American miller will be unable to retain any part of the Cuban flour trade unless immediate relief is secured.' In view of these facts, is it possible that a protectionist Congress can ever think of opening our market to Cuba's product free, while allowing a great Western interest to be absolutely excluded from her market?

"Giving the fullest protection to all Eastern interests, as the proposed tariff bill does, surely no man of good judgment wishes to expose a Western interest to serious injury, especially when it is manifestly easy to protect it and promote it.

"Certain wise men ask: 'How can we sell farm products in South America when the same things are produced there?' Cereals are undoubtedly grown in the southern-most part of South America, but the wise men will remember that the cereals and sugar do not grow in the same soil, and the sugar countries of South America and the West India islands contain 40,000,000 of people who import the largest part of their bread stuffs.

"The worst proposition is put forward by those who say: 'Let us put sugar on the free list now, and next year we will take up the subject of reciprocity.' I understand their logic. It is to make sugar free this year without condition, and next year to ask Spain if she will not kindly consent to grant us reciprocal trade?

"I do not mean, in anything I have said, to imply that reciprocity is only a Western interest. It will prove beneficial and profitable both to the farm and the shop. What for instance could be more natural or just than that, in giving a free market in the United States to hides from the Argentine Republic, we should ask the Argentine Republic to give a better market than we now have for the product of leather from the United States? The many forms in which our business interests will be promoted by reciprocity cannot be known until the active commercial men shall have developed those forms by investigation and experience.

"Finally, every free trader in the Senate voted against the reciprocity provision. The free trade papers throughout the country are showing determined hostility to it. It is evident that the free trade senators and free trade papers have a specific reason for their course. They know and feel that, with a system of reciprocity established and growing, their policy of free trade receives a most serious blow. The protectionist who opposes reciprocity in the form in which it is now presented knocks away one of the strongest supports of his system. The enactment of reciprocity is the safeguard of protection. The defeat of reciprocity is the opportunity of free trade. Yours very respectfully,

JAMES G. BLAINE."

M. N. A.

THE Executive Committee of the Millers' National Association met, with full attendance, except the Wisconsin representative, in Chicago September 16. The proceedings were eminently harmonious and satisfactory. A number of committee reports were received and acted upon.

***

A scheme was formulated for the organization of an association of exporters within the National Association, which will be submitted to the members at an early date. It is proposed to have every export shipment traced — its movement reported at each point of trans-shipment and a record kept of its movements until delivered to consignor. The scheme is thoroughly practical, and will be of the greatest value to members.

***

Relative to the recent amendment offered by Senator Sherman and adopted by the Senate on the 6th inst., and regarding which Secretary Barry recently issued a circular (printed elsewhere in this paper) to all members, the Executive Committee adopted the following resolution:

Resolved, by the Executive Committee of the Millers' National Association, in session September 16, 1890, That we do unanimously and earnestly protest, in behalf of the flour manufacturers of the United States, against the final adoption of the amendment offered by Senator Sherman and adopted by the Senate September 6, limiting the payment of drawback on exported merchandise to claims amounting to $10.00 or more, inasmuch as all smaller millers will be thereby debarred from the benefit of drawbacks on burlaps exported around flour, and, as the measure is clearly legislation in favor of the larger and wealthier manufacturer as against the smaller and poorer one, we respectfully urge the honorable Committee of Conference, in considering this section of the tariff bill, to further amend by striking out the $10.00 limit referred to.

The Secretary was subsequently instructed to proceed at once to Washington to personally present this protest and use every possible measure to secure justice in the matter and have the tariff bill, as regards jute and the drawback upon exported burlaps, left in the same shape that it left the House.

***

The Executive Committee decided to join hands with the National Transportation Committee, which is an organization of shippers resulting from the recent attempts of railroads to put their "uniform bill of lading" in force.

***

Several applications for membership were acted upon and action taken regarding two or three patent matters and complaints.

The feasibility of organizing a millers' excursion to Europe, immediately following the next annual convention, was discussed, but action deferred until later. The committee will doubtless be called together again in the near future to act upon several important matters pending.

MILWAUKEE REVIEW.

OUR September review of the market is not as encouraging as we had reason to hope at our last report, and may be fairly said to prove our position taken last month, that the market was being run up too high and would experience a decline. On August 15 No. 2 sample spring wheat sold firmly at 98c on track; choice patent flour sold at the same time for $5.25 to $5.50. About the 20th to the 25th of August the same grade of wheat had reached $1.04, and flour $5.75 to $6.00. From this point a gradual decline has been going on, until the same grades are about 96c for wheat and $5.50 for flour, and not much inclination to trade. The millers shake their heads and simply say "dull," which is an invariable consequence of a declining price of wheat.

The crop must be in pretty good milling condition now, and the mills may be said to have fairly started on the season's run, and the scramble for orders will, as a matter of course, have its effect on the flour market.

Sellers of sample wheat are walking around nervously, whispering in the miller's ear prices at which they can buy wheat, but even that brings nothing but a shake of the head. Some of them are talking 85c wheat, but to those who are dealing in the staff of life it may not be safe to rely on such predictions. The English markets keep up pretty well, although they are not free buyers at present, as is explained by the fact that their home deliveries last week were very large, by reason of fine weather, and prices of English wheat about 2s 6d per quarter above the same time last year.

Stocks of wheat on passage for the United Kingdom and the Continent are still very large, being something over twenty-four million. Their receipts during the past week were about four and a half millions, against a consumption of four millions, showing their stocks to be increasing.

The movement of wheat at our primaries is increasing, but it does not reach last year's figures by many thousand bushels. In fact, it is only about half to two-thirds of last year's movement.

Millstuffs are not so high as last reported, though in good demand at about $12.75 to $13.00 for sacked bran and $16.00 for sacked middlings.

B. Stern & Co.'s Jupiter Mill is about ready to start again, having just blown steam through their new compound engine

The political campaign, which this year will be a heated one, is taking much attention, and, in the dull condition of the market, politics are more generally discussed than wheat or flour, and so we may expect it to be until the fall election settles it for another two years.

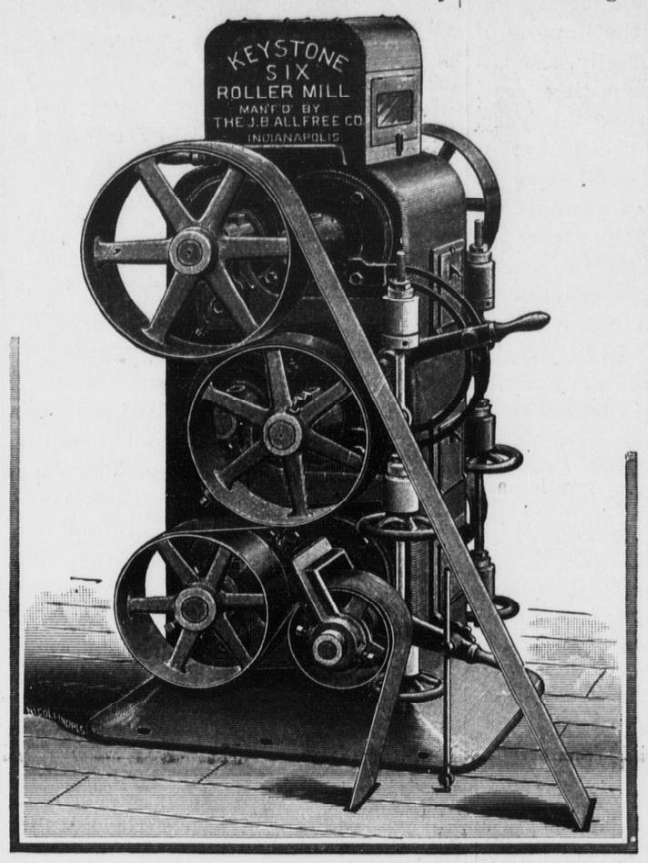
DONALDSON.

MILWAUKEE, September 18, 1890.

MANITOBA CROP REPORTS.—The Winnipeg *Commercial* of September 15 has the following in regard to the situation in Manitoba: "Sunday and Monday was cloudy, cold and windy, and favorable to drying out the soaked sheaves. Tuesday followed clear and warm, but on Wednesday the drizzle again started, continuing until Friday morning. There was snow with the rain at some points in the western section and extending into the territories, being heaviest in the district westward from Manitoba. The snow seemed bad at a distance, and caused a great boom in wheat at Chicago, but it could not be as injurious as the warm rains of the previous two weeks. The very low temperature which prevailed last week, with the heavy, cold winds following the rain, were the saving features, and with good weather to follow there need not be any alarm about the snow. The frosts mentioned did no material damage. There is a little uncut grain in some sections, mostly oats, but nothing to signify.

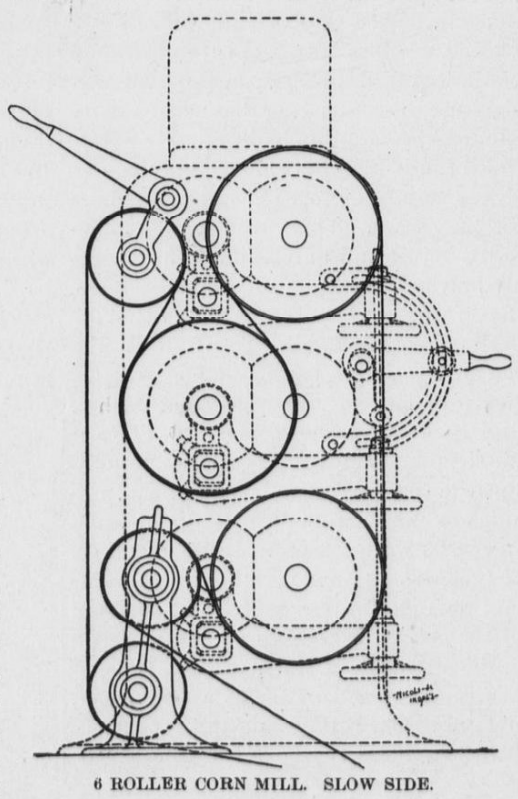
THE KEYSTONE 6-ROLLER MILL.

AFTER a long season of experiment the J. B. Allfree Co., of Indianapolis, Ind., have satisfied themselves and a number of practical millers, that their new "Keystone" 6-Roller Mill, designed for reducing corn and other cereals, is a perfect machine and they now place it on the market with full confidence that it will do all that they claim for it. They say: "From the very nature of things, corn milling has offered many obstacles to the successful use of rolls, corn being in itself very hard and carrying with it usually a considerable amount of foreign matter such as cobs, etc. After several years of experience and almost incessant experiment, quite a number of features were found to be absolutely necessary, viz: *At least three Reductions, great Strength, powerful Drive, positive Differential, both simultaneous and independent Setting, easy Access, great Rigidity, and Simple and rapid Tramming.* All these features are embodied in this mill."



6 ROLLER CORN MILL. DRIVE SIDE.

The illustrations herewith are very plain and easily understood. Any further information desired concerning this machine can be obtained by addressing the Company above named.



6 ROLLER CORN MILL. SLOW SIDE.

AN OLD KENTUCKY MILLER.

IN the banks of South Elkhorn Creek, seven miles west of Lexington, there lives perhaps the oldest miller in active service in the United States. His name is Robert Ryman, and for seventy-four years he has tended the saw and grist mill that his father, Jacob Ryman, built there ninety-four years ago. A recent visit to this mill found the venerable owner in charge. He is ninety-one years old, about 5 feet 8 inches high and will weigh 120 pounds; he is cleanly shaven; his eyes are deep blue, and he uses no glasses; his hair is light brown in color and rather thin; he is slightly stooped, but by his lively manner one would not think him more than seventy years old. His head is about the medium size, and while not an ideal one would be considered phrenologically as belonging to a man of more than usual intellect. His movements are quick, and in going up and down the steps of his mill he shows as much agility as a man of forty. He can handle a two-bushel sack of wheat or corn with apparent ease. His mill is a dilapidated, moss-covered frame structure, about forty feet long and twenty feet wide. It contains a set of burrs, bolting cloth, elevators, etc., for making flour, and another set for grinding corn meal. It has three doors, the ceilings being extremely low. The wheel that sets the machinery in motion is eleven feet in diameter and is what is known as a "breast" wheel, the water striking it just below the center.

On the north side of the gristmill are the ruins of the sawmill. The saw used was an upright, and the process of cutting lumber with it was necessarily slow.

"My father, Jacob Ryman, came to Kentucky from Pennsylvania about 1796, and bought the old mill property here," said Robert Ryman. "There was a common 'tub' mill here, and my father tore it down and rebuilt it with the house you see before you. That was three years before I was born. Father did a big business both in grinding wheat and corn and in sawing lumber. When I was five years old father died, and the mill was leased until I was seventeen years old. I then took charge of it. We had only the seventy-five acres father bought, and we were poor. Emigration to Kentucky was then at its height, and I made considerable money by sawing lumber. Nearly all the older houses in this section were built with lumber sawed by me. I worked day and night for many winters, and was thus enabled to buy 150 acres of land adjoining our little farm. I then set to work to buy Negroes to till the land, and before emancipation I owned six men and four women. I made money farming, but the Negroes I found a costly luxury, and I am better off without them. I was too young to enlist in the war of 1812, and when the Mexican war came there were so many younger men anxious to go that I did not desert my mill. Of course I was too old to serve in the War of the Rebellion, but I was a strong Southern sympathizer and was sorry to see the South lose the day. My only experience with the soldiers of the Rebellion was in the horse line. A Confederate soldier left a worn out horse on my farm and took my best saddle horse away with him. I fed his cast-off animal, and just as I got him nice and fat a Federal soldier came along and pressed him into service. My mill was not disturbed by the soldiers, and I continued to make flour and meal all the time the war was going on. I have done so ever since. I grind corn for the neighbors now and make the flour we use at home; besides, many of our neighbors like the flour this old mill grinds better than they do the breadstuff that comes from these new-fangled roller-mills. My father used to ship his flour in barrels to New Orleans and all river towns. Here is the brand he used on the heads of the barrels. You will see it read, 'J. Ryman, No. 196, Burr.' In those days 'burr' flour was scarce. Father paid $500 for the first set of French burrs he put in, and they were the envy of all the millers in this part of the State.

"I was married when twenty-six years old, and my first wife presented me with three children. I am now living with my third wife, and have three children living. I have twenty-two grandchildren and ten great-grandchildren. I have had only one spell of sickness in my life; have used tobacco (chewing) since I was five years old. I always took a dram of whisky whenever I wanted it, but I was never drunk. I have lived on no special diet, but have been always regular in my habits. I have eaten breakfast every morning for the last eighty years at 5 o'clock, dinner at 12 and supper at 6. I drank coffee for breakfast, milk for dinner and tea for supper. I have worked hard ever since I was twelve years old, and I do not think hard work ever killed a man or made one crazy. It is something else. I have always had the faculty of leaving my business behind me when my day's work was done. In this way I have been a good sleeper. Sleep is the only thing that will restore a tired man, and I think the young men who die so suddenly now do not die from over-work, but from the loss of sleep. I have always been a Democrat. My first vote was cast for Samuel Woodson, who ran for Congress in this district in 1820. Andrew Jackson was the first President I ever voted for, and I have voted the Democratic ticket ever since. In 1860 I voted for John C. Breckinridge, and I feel proud of it to-day. The bitterest dose I ever swallowed, however, was when I voted for Horace Greeley in 1872, and I wasn't sorry that he was beaten. No, I don't understand the tariff, and I don't believe half the people who talk about it do. In religion I am what they call a 'Campbellite,' or follower of Alexander Campbell. I have belonged to that church for more than forty years, and have tried to live up to its teachings. Only twice have I been out of the State, and then it was to go to visit relatives in Missouri. I subscribe for four newspapers."

Among the relics exhibited by Mr. Ryman was a square oaken gallon measure, made by his father, and a brush used by his father to remove the flour from bolting chest.

A PROMINENT manufacturer said recently: "I paid a bill the other day, without a murmur, simply because of the way it was worded. My engineer found that his hot-water pipe would not work, and after puttering at it for an hour, concluded to send for a machinist. He bothered with it for half a day and concluded it mus come apart. I was much annoyed, for that meant the stoppage of my factory for a long time. Before I gave the order to take it to pieces some one suggested that a neighboring engineer be sent for, as he was a sort of genius in the matter of machinery. He came and after studying the pump awhile, took a hammer and gave three sharp raps over the valve. 'I reckon she'll go now,' he quietly said, and putting on steam 'she' did go. The next day I received a bill from him for $25.50. The price amazed me, but when I had examined the items I drew a check at once. The bill read this way: Messrs. Blank & Co.; Dr. to John Smith. 'For fixing pump, 50 cents. For knowing how, $25. Had he charged me $25.50 for fixing the pump, I should have considered it exorbitant. But 50 cents was reasonable, and I recognized the value of knowledge, so I paid and said nothing."

OUR BUFFALO LETTER.

THE most gullable people connected with the grain trade are the canalboat men. Long acquaintance with the many sharks who infest the canal from Buffalo to New York has not sharpened their wits a particle in one respect, namely, that of being bled by agitators of the "Captain" Clark stamp. That blatent, lazy loafer came to the front some twenty years ago, and since then has been supported by the poor fools who navigate the canal all summer and starve aboard their boats during the winter. Since the formation of the Buffalo Forwarding Company two years ago, however, his rope has been gradually shortening. This company has, through its excellent management, saved a few dollars for the boatmen, and the interest on mortgages has been paid up for the first time in years. They had no use for either Clark or his superior, Captain Depuy. The situation was growing desperate, until some captain complained that the mills at Lockport were taking too much water from the canal. Here was an opportunity not to be lost. Before the sun set that day Clark had fifty affidavits to show there was not enough water left in the canal when the mills were running, to float a plank. He has kept himself before the public through the help of newspapers ever since, at the same time not forgetting to levy an assessment on every boatman as soon as he arrived. Humbug Clark and Captain Depuy have injured the canal more by their senseless agitation than all the water taken for milling purposes ever can, even if the banks of the canal were lined with mills. Their championship of any bill for the good of the canal is sure to kill it. The skunks should be clubbed.

The case of Wright & Son vs. Schoellkopf & Matthews is up again. This time it is flavored with a spicy incident which is causing no end of unfavorable comment. The case was, it appears, referred by the trustees to a prominent lawyer for an opinion. He decided that the case could not be reopened unless new specific charges were made. The opinion was to be kept a secret, but imagine the astonishment, when it was read before the Board about three weeks ago for the first time, to find simultaneously with this opinion a charge (that of refusing to submit to the finding of the reference committee, for which the punishment is expulsion), as if in compliance with it. There was just a little too much haste. At a special meeting of the trustees held Thursday last, the matter was brought up for final decision. A trustee who knew really nothing about the case was induced to offer a resolution expelling Messrs. Schoellkopf & Matthews and Mr. A. R. James. Three of the members immediately voted to expel, but one who thought the proceedings a little rash arose and asked whether specific charges had been made against the three millers, in accordance with the opinion and also the demands of Messrs. Schoellkopf, Matthews and James. Then, and only then, was it discovered that in their haste to expel the gentlemen, that important part had been entirely neglected. This was a crusher, and the case was dropped. Surely, after such an exhibition of foolhardiness, one would imagine enough of that sort of business had been done for one season. But no; the man on whom the Board of Trustees seemed most to rely for support spat upon his hands for a fresh hold and let his hangers-on down to the bottom of the well again. The reformers started to tinker with the by-laws, twisting and mixing up the old secretary with a young assistant in a manner which can hardly be amicable to either party; then took the inspector's books from a competent bookkeeper's hands and placed them under the supervision of the secretary of the Exchange. Not only this, but they attempted to meddle with Weighmaster Smith's department. But genius punctured that notion with these simple words: "Stop right there. Don't you dare to interfere with my business." That ended the last lesson. This business of reform has gone far enough in the wrong direction, and the quicker the trustees realize it, the better it will be for the future prosperity of the Merchants' Exchange.

In pairs and singles the boys are returning from their vacations, all looking tired and weary. To gaze on some of them makes you wonder what crime drove them out of this beautiful, healthy city. Mr. W. W. Sloan, once the best of company and the life of the Board when present during the noon hour, has lost his tongue, or is too tired to speak; ditto Messrs. C. H. Gibson and Simons; ditto nearly all of them.

The wheat crop in this county has turned out as well as expected. Clint Newman is happy in the possession of all the wheat within a reasonable distance of his Akron mill; the Messrs. Urban, Harvey & Henry and the Banner Milling Company having withdrawn their buyers from that section, on condition, it is said, that he would in the future mind his own business. The syndicate buyers will be in the fields early next year.

Speaking of Mr. Newman reminds me of a story which does not come under the ban of telling tales out of school. "Clint Newman," remarked a gentleman on 'Change, "is always ready to do a good turn, but is like the bear owned by the Gypsy. A persistent fly annoyed his sleeping master, and several times had the bear driven it away. At last the animal thought he would kill it, and when it lit upon the man's nose he let drive with his paw."

The following new grading of oats in this market will be of value to shippers:

No. 1 White Oats.—Shall be white, sound, clean and reasonably free from other grain, and weigh not less than thirty-two (32) pounds to the measured bushel.

No. 2 White Oats.—Shall be seven-eighths white, sweet, reasonably clean and reasonably free from other grain, and weigh not less than twenty-eight (28) pounds to the measured bushel.

No. 3 White Oats.—Shall be seven-eighths white, but not sufficiently sound and clean for No. 2, and weigh not less than twenty-three (23) pounds to the measured bushel.

No. 4 White Oats.—Shall be three-quarters white, but not sound or heavy enough for No. 3.

No. 1 Oats.—Shall be mixed oats, sound, clean and reasonably free from other grain, and weigh not less than thirty-two (32) pounds to the measured bushel.

No. 2 Oats.—Shall be sweet, reasonably clean and reasonably free from other grain, and weigh not less than twenty-eight (28) pounds to the measured bushel.

No. 3 Oats.—Shall be all oats that are damp, unsound, dirty or from any other cause unfit for No. 2.

The following rule was added to the by-laws of the Merchants' Exchange and became operative on the 30th of last month: "On all purchases or sales of c. i. f. grain in this market, when time of shipment is not specified, is to mean 'prompt shipment,' and prompt shipment is to be not exceeding ten days from the date of purchase or sale; and that trades made for immediate shipment shall not mean later than five days from the date of purchase or sale."

Mr. A. R. James has returned from his vacation to the Adirondac Mountains. He related some very large fish stories, all of which were believed by the "boys" on 'Change—as fish tales usually are when not accompanied by proof.

Mr. Thomas Thornton, the surviving member of the old firm of Thornton & Chester, millers, was stricken with apoplexy two weeks ago and is not expected to recover sufficiently to ever attend to business again. Mr. James F. Chard, under whose able management the business has virtually been for some years, will continue to look after the interests of the mills.

Our elevator men are preparing for a rush of barley from Canada as soon as the date is fixed for the McKinley Bill to go into effect. The bill increases the duty from 10 to 30 cents per bushel. In this, however, they may be mistaken, as the Canadian farmer does not care two straws about the new bill this year. England, they claim, stands ready to take all their oats and peas, and as barley is only half a crop and oats selling at 45 cents per bushel they can afford to feed it at 60 to 65 cents. Still we shall see quite a large amount of choice barley coming this way, even if 90@95 cents must be paid here for it, as some of our brewers think they cannot make good beer without it.

Mr. Phillip Houk, the best known flour dealer, probably, in this part of the State, has been seriously ill with erysipelas, but was out again last week looking a little thin-skinned. This world was made to live in and enjoy, Phillip thinks, and he means to stop with us for some time longer.

The contract for constructing a tunnel 6,700 feet in length, within fifteen months, for the Niagara Falls Construction Company, has finally been let to Rogers & Clement, of New York. The construction company has acquired 225 acres suitable for mill sites along the river between the falls and La Salle, and when the work is under way it is expected that the land will be taken up for building purposes. The scheme of utilizing the power of the great Niagara River is a mighty one and has long been considered by our most eminent engineers. The tunnel is regarded as the only feasible plan, and if sufficient capital can be raised to extend it to Buffalo there is little doubt but factories and mills will line its banks for the twenty-two miles between the two points. An international commission, of which Sir William Thompson is president, has been in session for some time past in London, Eng., to decide on the most practicable and economical method of extending this power. Prizes have been offered for the best plan throughout Europe, and there is a standing offer from Buffalo business men of $100,000 for the best plan for harnessing this power.

The Attica Mill is running twenty hours out of the twenty-four and is reported away behind in its Buffalo orders. F. Crory, of this mill, goes to Fultonville to take charge of a small mill owned by Mr. Bork.

The last advance in wheat was a boon to our millers. It lifted them out of the hole and put them on the road to prosperity again, so to speak. All the mills are running more than full time, and Eastern orders came in so fast that it was found necessary to advance prices steadily. Our supply of good old hard, is dwindling very fast, only 200,000 of No. 1 and 215,000 of Northern remaining in store on Saturday. I call it good old hard because the samples of the new crop shown thus far are only slightly better than the frosted wheat of 1888. However, these may be only "test samples," i. e. samples sent to see whether a kick will be made against the miserable mixture. At all events, Buffalo will not establish her grades yet, and if any of this wheat is sent here on the expectation that it will grade No. 1 hard, the shipper will find he has made a mistake. The No. 2 Northern is particularly slimsy stuff, but one of our practical millers says it will make good, strong flour.

Flour is now selling at $6.25 wholesale and $7.00 retail for best patent spring, with the winter about $1.00 under. Before the advance, springs sold at $5.80@6.50.

The Central strike seriously crippled our grain trade, and buyers living on that line of road have flocked to this to abuse shippers for not sending purchasers. A great many trades were declared off, entailing considerable loss to our commission men. Enormous quantities of flour received by lake were stored in warehouses for two weeks. There is little change yet in the state of affairs, cars being very scarce, except for the through stuff, the local trade being obliged to suffer, while this business is taken care of.

The Ontario elevator is finished, having received the first cargo a week ago. Capacity, 400,000.

Millfeed is high, but according to our best informed dealers it is going still higher before snow flies. Coarse winter bran sold at $16.50 and spring $16.00 per ton, with fine white at $19.00.

The Springville mills, owned by that popular horseman, Burt Chaffe, will have an addition of three stories.

Mr. H. J. Harvey, of the firm of Harvey & Henry, took his vacation at Grand Island. Mr. Henry stayed at home, bought wheat on the breaks and sold flour on the bulges.

Canal freights continue steady at 4c on wheat and 3½c on corn to New York. Boats are plenty. In fact, the Buffalo Forwarding Company is considering a reduction in rates, in order to move some of them out of the road.

The following were elected members of the Merchants' Exchange last Thursday: Daniel B. Strickler, Francis C. Shepard, John V. Marion, Harvey D. Blakeslee and Martin & Lautz, of Buffalo; from South Alabama, E. A. Barrett; from Batavia, John M. McKenzie.

An inspector of hay will be appointed in this city soon. The idea of having hay inspected is generally regarded with favor by our commission men, who receive large consignments from their grain shippers every winter. This will do away with complaint on the part of both shipper and buyer.

BUFFALO.

MILLING AND MECHANICAL NOTES.

AN exchange says: "Leather belts with the grain side to the pulley will drive 30 per cent. more than if run with the flesh side. The belt as well as the pulley adheres best when smooth, and the grain side adheres best because it is the smoothest." Still there are scores of engineers that maintain just the opposite view, and there don't appear to be a happy medium on which all can agree.

PRACTICE varies, but principles are eternal. Get all the practice you can, but learn the principles too. While the knowledge of the books, the schools and the laboratory may not fit a man for the exigencies of a varying practice, it will supply him with the fundamental principles which his practice calls into play.

A CEMENT that is said to be strong enough to stick anything, may be made as follows: Take two ounces of gum-arabic, one and a half ounces of fine starch and half an ounce of fine sugar. Pulverize the gum-arabic and dissolve it in as much water as the laundress would use for the quantity of starch indicated. Dissolve the starch and sugar in the gum solution. Then cook the mixture in a vessel suspended in boiling water until the starch becomes clear. The cement should be as thick as tar and kept so. It should be kept from spoiling by dropping in a lump of gum camphor or a little oil of cloves or sassafras. The cement is extremely strong, and will stick perfectly to glazed surfaces.—*The Builder and Woodworker.*

IT is claimed that the grain elevator at Minneapolis Junction is the largest in the world. It is 336 feet long, 92 feet wide and 175 feet high. During its construction the carpenters and joiners used over 6,500,000 feet of lumber of all kinds, besides thirty-two carloads of nails. The engine used is capable of handling 175,000 to 200,000 bushels of grain per day, or enough during the year to equal the combined products of the State of Minnesota and the two Dakotas. Two hundred and fifty cars have often been loaded at this elevator in ten hours.

ROLLER MILLING IN SMALL MILLS.

BY A. STEIGER, London, Eng.

AS soon as roller milling was introduced in this country it became evident that a time would come when small millers would stand before the alternative of having their trade go forever, or of being compelled to adopt the roller system to bring their mills up to the standard of the large mills.

This time has now arrived, and a suitable and efficient roller system for small mills is a burning question, and one of life or death for many a small miller.

I have for many years, practically since the time when roller milling was first extensively adopted in this country, had in view a system which would meet the requirements of small mills. I alluded to it in my paper read at the meeting of our Association in Plymouth two years ago on "The Selection of Water Motors for Flour Mills." That subject was of sufficient importance to be treated separately, allowing only a short reference to be made to milling matters proper.

To-day I hope to have the satisfaction of interesting you in the milling system which I advocated then, and which I advocate still, as the most suitable for small mills, and although, unfortunately for them, small millers are represented in our Association by but a few members, I trust you will all follow me, and by taking part in the discussion contribute your part for the benefit of small millers in general.

My task is to lay before you a system of small mills which, by a small expenditure for additional machinery, will give results at least equal if not superior to those obtained in large automatic mills. It is clear that now, as roller flour from large automatic mills of this country and foreign manufactured flour *command the markets*, small mills can only reconquer the lost field and stand the competition of large mills by producing an equal article.

To find the means to this end I must first of all lay the automatic system, as applied to large and small mills, on the dissecting table, examine their comparative advantages and disadvantages, show how the comparison is unfavorable for small mills, and further emphasize the facts that the cost of an automatic plant reduced to one sack of flour per hour is very much greater in the case of a small mill than in that of a large mill, and that in small mills neither space nor the available power justify the large expenditure for all the machinery in a complete and perfect automatic roller mill plant.

I take it that most of the small mills which are now under the necessity of adopting some sort of a roller plant are water mills, and therefore I wish again to draw your attention to the importance of the proper utilization of the water power. If you calculate the annual profit made on the output in this time of one-horse power, and take into account the amount of power gained by replacing the old water wheel with a good turbine from a responsible firm, which *guarantees* the power of the turbine, you will find that the investment of money in such a motor is one of the best investments that can be made, and that the cost of the turbine is soon recovered by the profit made out of the power saved.

This calculation gives particularly striking results in the case of very low falls, from 20 inches to 60 inches, where very often the power can be doubled by the adoption of a turbine.

As regards the subject of my present paper, I would not have ventured as an engineer, to bring it before you had I not had practical experience as a miller, and acquired that experience in mills on the system which I propose.

A criticism of the automatic system has not yet been attempted, yet it is this criticism which gives us all the points which tend to favor the periodical system. That the automatic system is not perfect is clear from the fact that the opinions of millers, and also milling engineers, differ often very widely on certain operations, and the treatment of certain intermediate products, proving uncertainty on these points.

In adapting the roller system to small powers and small mills, the only mode followed hitherto has been to cut down plant and number of operations. I hope to show a better way.

The question, "Can such a small automatic plant give as good results as a large one?" must be answered in the negative. The technical reason for this fact is found by comparing the diagrams of mills of different capacity,—say of a 3-sack plant, a 7-sack plant, a 10-sack plant, and a 20-sack plant. You find not only a difference of the dimensions of the machines in proportion to the capacity, but also a difference in the *number* of machines, or, what is the same in the number of operations. This difference is essential to note, for it is clear that in all mills grinding the same wheats, the intermediate products are the same, differing only in quantity in proportion to the output of mills of different capacity. The 20-sack plant subdivides the process into a greater number of operations than the 3-sack plant or 7-sack plant, because of such a sub-division resulting in a better quality of the flour and a higher percentage of the same.

Machines might be made large enough to deal with the intermediate products of the 20-sack plant in as few operations as are generally adopted in a 3-sack plant; it would simplify the process and lower the first cost of the plant, yet I do not think that a miller with his complete 20-sack plant would adopt such an idea if he were to put up a second plant of the same capacity, but would prefer to lay out more money and have the plant complete.

There are certain laws in roller milling, as in every other manufacture, which must be strictly followed, and on the common sense with which they are applied depends the success of the mill.

Beginning with the breaks, you find generally six in large mills, four or five in mills of medium size, and four, or even three, breaks in small plants.

Although the plant with three breaks may have exactly the same breaking length per sack of flour produced as the six-break plant, the result will be different. Of course you make the bran clean, because you *must* get it clean, but if you examine the break meal, from which you extract the best material—middlings and semolina—you will find an important difference; you will find more break flour, the middlings are mostly fine, and only a small percentage of coarse semolina is found. It is the first maxim of roller milling to convert the grain into middlings and semolina for the purpose of purification previous to subjecting them to further operations and to eliminate the bran while producing as little flour as possible. It is clear to me that this can only be accomplished by more frequent operations with as little pressure on the break rolls as possible, yet it is just this point on which opinions differ very much.

It is evident that by going close on the break rolls—as you have to in a break plant with only a few breaks, you have the shearing action of the grooved rollers combined with the superfluous action of pressure. You crush by that pressure part of the semolina produced by the shearing action, and you crush that semolina without purification, and in contact with inferior products, such as bran. The flour which is produced by the shearing action of grooved rollers on wheat is of inferior quality to the flour produced by crushing the semolina on those rolls, which itself would be of still better quality if produced from the same semolina after purification.

It is principally claimed for the short break system that the bran is just as clean and as broad as that finished on a six break plant, and that by the adoption of a short system so many hundred pounds are saved. I am quite willing to admit both, but the success of a mill depends, not on the clean bran only, but also on the superiority of the flour, and it is evident that the larger the percentage of pure middlings and semolina the higher is the flour in quality, making a higher profit.

But the short system proves that the number of grooves in break roller mills is, within certain limits, not so important as is generally attributed to it. I emphasize this, as I must refer to it again.

The less the pressure exerted on the break rolls the larger the percentage of middlings and coarse semolina; moreover, these are obtained in a condition rendering the purification easier and more thorough.

Recently even the large mills have adopted the four-break system. You will all remember the cry raised during the first years when roller milling was introduced, that the crease dirt deteriorates the stone flour, that the bad color of flour must be attributed to that crease dirt, and that it must therefore be removed by all means. This cry seems to have been entirely forgotten, and those who then urged the importance of removing it let it now go with the flour. If the first break flour from a complete roller plant, with say, six breaks, when it is from a half to three-quarter per cent., is examined under the microscope, hardly any starch or gluten is found in it, but what is found is fibrous matter from the skin and clay or other mineral matter, both of which, however small their quantity, injure the quality of the flour. The test of the first break flour, therefore, proves that the first break operation is essentially one of *wheat cleaning*.

It is admitted that none of the machines included in the wheat cleaning system are capable of removing the crease dirt, which justifies us fully in considering the first break, with a somewhat severe action in scalping, as the finishing operation in wheat cleaning. Many millers are already of this opinion. An objection to my argument is that the wheat must be graded first, and the first break rolls do not split the wheat along the crease. Even if the grain is split transversely, part of the crease dirt will be removed by using a reel orcentrifugal as a scalper in this instance.

The endeavors to invent a machine for splitting the grain along the crease are not yet discarded, which is a proof that the removal of the crease dirt is held important by many millers. As long as we have not got such a machine as a wheat cleaner, I consider the first break essential, and even a valuable addition to the wheat cleaning in mills on the low grinding system.

Speaking of the scalping of the breaks, it has lately become the "fashion" to use fine covers. This seems to go hand-in-hand with a reduced number of breaks, and may also have something to do with the exclusive use of sieve purifiers. The reason for the use of finer scalping covers is evidently to reduce the number of reductions on smooth rolls, by doing part of their work on the break rolls. This is in contradiction with another maxim of rational roller milling—that middlings and semolina should be purified before being subjected to further reduction. If the number of operations is to be reduced at all it ought to be done without affecting the quality of the flour.

It cannot be my task to describe or criticise any machines used in roller milling; by doing so I would only repeat what others have said and written before me; but in speaking of the various operations I must refer to one adopted in some mills immediately after the scalpers and that is the aspirator or pneumatic sorter. During the breaking down of the grain, particles of pure bran are separated which it is well to remove from the broken wheat before it goes to the next roll, to say nothing of the fact that a repeated contact of all intermediate products with a current of air, is beneficial to the color and baking quality of the flour. I consider this aspiration after the scalpers, though not new, a very valuable operation, particularly where much soft wheat is used.

Again as to the scalping and re-dressing of the break meal, the large mills have the advantage over the small ones that they can dress the break meal from some of the breaks separately, and take the inferior break dunst to the end of the reductions, while the middlings from the last breaks are sufficient in quantity to be purified on an extra purifier. All this would make a small automatic plant too costly.

The next operation which I have to consider, namely the purification of middlings and semolina, is the most important in a flour mill, and here again the advantage of a large automatic plant over a small one is apparent.

The larger quantity of middlings in a large mill requires a larger purifying surface, but instead of grading them into the same number of grades as in a small mill, and giving each grade a larger surface, the same purifying surface is maintained for each grade; but we make more grades, so that we can give each grade a current of air. It is obvious that the results are superior.

Very little attention has hitherto been paid to the re-purification of the second quality of middlings, even in large mills. The purifiers, and principally the sieve purifiers have lately been brought into a high state of perfection, yet they do not prevent some good middlings going to the second quality which ought to be, and can be recovered by repurification. The air current going through the sieve has to do two things: it has to remove the finished fluffy stuff, and to separate the pure middlings from those which still have bran adhering to them. We can only come near perfection in the combined work of the air current by grading the middlings as much as possible.

In Austrian and Hungarian mills, I believe also in American mills, they have got a very elaborate purification plant for grading and regrading, purifying and repurifying the middlings and semolina. I do not for a moment say that such an elaborate system should be adopted in English mills, for the requirements are altogether different here, but it shows us the importance attached to a proper and complete purification in mills, against which you have to compete.

The repurification does not necessarily require special machines, except perhaps a few elevators to bring the second quality of middlings from one purifier to another with suitable covers, or to the grader. In the re-purification we have no longer to deal with the fluffy stuff, as it has already been removed in the first passage through the purifier, and if we pass the second middlings over a sieve slightly coarser we shall accomplish the re-purification very satisfactorily, otherwise, I believe, the aspiration of the breaks after scalping prepares the middlings for purification.

The consequences of incomplete purification show themselves in the reduction of middlings and semolina, not only in the deterioration of the flour, but also in the necessity for more operations. The purer the material the quicker the reduction may be.

Quite apart from this, large mills have more reductions than small ones, so as to treat the various intermediate products separately, and in a manner that suits their respective peculiarities. This separate treatment of all the immediate products is necessary to high quality and percentage of flour, even if only one or two grades are made. It must be emphatically pointed out that the result of short system mills suffer either in quality or percentage of flour in comparison with large and complete mills.

The above comparison of large and small mills makes it evident that the advantages are all on the side of large mills, say 20-sack plants, and that the cost in labor and outlay of a small plant of one sack per hour, and of equal number of reductions, if attempted automatically, is very much higher than in the large plant. I come therefore to the conclusion that only the *non-automatic* or *periodical* system will enable small mills to produce the same results in percentage and quality as the large ones.

I prefer the name *periodical milling*, because it is more explicit than the expression "non-automatic," which expression might imply that it involves an amount of hand labor which would increase the working expenses of a mill. This is not the case, as you will presently see.

The periodical system of milling is nothing else but the performance of a number of operations on the same machines, but at different times, or, in other words, the alternate use of a few machines for the treatment of the different products. This reduces the cost of the plant very considably, and adapts the mill to the variation of the available power, while I can increase or reduce the number of operations according to the demand of grades of flour.

The number of machines would in the first instance depend on the average available power; the greater the power and the more regular, the nearer the mill would represent an automatic plant, and the more we could reduce the number of operations.

There are, therefore, a good many ways to accomplish the work successfully in a periodical mill, and I must confine myself to giving you the idea of the working of such a mill with an assumed number of machines.

The wheat is cleaned in the ordinary way, and on the usual wheat cleaning machines, but including the first break with its scalper and aspirator. The large sized wheat and the small sized wheat would be cleaned separately, each going into its special bin for mixing after the cleaning operation. The first break roll thus would be adjusted first for the large and afterwards for the small wheat. The small percentage of dunst and middlings obtained from the scalper would be taken into sacks or hoppers, from which they can be fed into the proper machine at a convenient time. This would constitute the first period, requiring perhaps seven horse power in a plant turning out, say, 300 sacks of flour per week, and would bring the wheat to the stage for second break.

By storing the wheat, particularly soft wheats when split, the moisture evaporates and the separation of the flour from the bran becomes easier.

The second period would consist in the granulation of the split wheat. But here comes the question: "How many breaks are to be used in a periodical mill?" If I maintain that six breaks give the best results, you would expect that I should suggest the use of six pairs of break rollers, each with a special grooving and separate scalper. This is, however, not necessary; three or four sets of break rollers will do. The second break would be effected on the first break rolls set a little closer. The number of flutes per inch is not of so much consequence as the proper adjustment of the rolls, exposing the kernels to the shearing action of the grooves with as little pressure as possible. A break roller mill with nine or ten flutes per inch will make as good a second break, if properly adjusted, as a pair of rollers with twelve or fourteen flutes, and eventually even a good third break could be made on a first break roller mill. I may be contradicted on this point, but I doubt whether many millers with automatic mill plants have ever tried

it, except they tried the short system temporarily, thereby crushing their best semolina. In many small mills on the periodical system several breaks are made one after the other on the same pair of rollers, and I have done it myself.

I do not say that bran could be cleaned on a first break roller mill, or a good first break made on bran rollers; there are limits to all things, and so also in the work of fluted rolls. Three pairs of fluted rolls there should be at least; if you have four pairs you will finish the granulation in the second period, making five breaks, including the first break in the first period.

If you make the experiment and let the wheat through a pair of fluted rolls three times, each time adjusting the rolls according to the size of the kernels, you will obtain a better material for subsequent treatment than if you let the wheat through the same pair of rolls, adjusting the same at once as close as required for the third breaking operation; thus my assertion above would be confirmed. Of course, if the miller does not require to get the largest possible percentage of middlings and patent flour he will confine his plant to four breaks, and thus concentrate the first and second periods into one continuous one, having this part entirely automatic, if he has power enough.

If only three pairs of break rolls are in the mill the granulation would be extended over three periods.

Over each roll there would be a hopper sufficiently large to hold the quantity for a few hours' working.

Although each break roll would make two breaks, only one scalper for each pair of rolls is required, as the miller has it entirely in his own hand to treat the material subsequently by whatever machine is convenient to him. He has much more freedom in the use to his best advantage of all the machinery composing his plant than is the case in automatic mills.

Aspiration after scalping, or practically purification of the breaks by a current of air would be particularly advantageous in periodical mills, because the same aspirator could, after the completion of the granulation, be utilized instead of special gravity purifiers, for purifying the coarse semolina. Coarse middlings can be very well reduced on fluted rolls of fine pitch. It is obtained principally from the second and third breaks, corresponding in size to the meshes of No. 18 or 20 wire cover. The reduction of this semolina on the scratch rolls after passing the aspirators, produced very little flour, but of good quality; the fine middlings produced by this operation go to the purifiers, where they are again exposed to a current of air, which favors the good color and quality of the flour.

Mr. Ashby, in his interesting paper on "The Color of Flour," read before this Association at its meeting in Paris last year, drew your attention to the effect of giving the wheat berry time to die, and of allowing time to the middlings to dry and wither before subsequent operations. This process of natural drying requires much time, but is accelerated by storing, as I have proposed for the periodical system, the cleaned wheat after splitting, when the air has a better access to the inner parts of the grain, allowing the moisture to evaporate, and further by subjecting the broken wheat to aspiration after each scalper, and the repeated purification of middlings. For soft wheats this process of drying is of considerable importance for improving the quality of flour, and deserving the fullest attention of millers. Mr. Ashby says that *that* flour made at his mills at Croydon on which he can place most dependence is made on a small non-automatic plant. This, coming from one of the most experienced millers in this country, is sufficient proof of the value of storing intermediate products for the above purpose, an advantage which is obtainable only in non-automatic or periodical mills.

The break meal made in a periodical mill can either be scalped and redressed just when it comes from the break scalpers, or carried to a bin and passed through dressers afterwards. This depends on the number of machines that can be put into the building. It is, however, preferable to dress the break meal immediately it is made, in order to have the middlings ready for the next operation.

The four pairs of break rolls with scalpers and redressers, which are at work during the second period, would not require more than eight or ten horse-power at the maximum.

The third period would include the reduction of the coarse semolina on the bran-roll, using it as a so-called scratch-roll, the grading of the middlings and the purification. The fine middlings produced from the large semolina on the scratch-roll go the same way and at the same time.

As these machines would require only four or five horse-power, we can in most cases also include the reduction of the pure middlings on a pair of smooth rolls, and run these along with the purifiers.

All the power can now be concentrated on the reduction of middlings and grinding of the dunst, either on chilled iron rolls, porcelain rolls or stones, or a combination system of stones and rollers. Keeping in view that millstones, owing to their severe treatment of the material during grinding, require absolutely pure feed to produce a pure and clean flour, it is best to reduce middlings on smooth rolls first, eliminating all bran and germ, and finish all the dunst from the tail sheets on the stones. In an automatic mill plant the use of millstones is inconvenient because of the frequent dressing, while in a periodical mill, where each machine has its short time of rest, there is always an opportunity to dress the stones without interfering with the work of the mill.

It has been contended for a long time that the roller system is not suitable for soft wheats. There are however now many roller mills working more or less successfully on soft wheats. It has been established and maintained by bakers, that stone flour, particularly from soft wheats, bakes better than roller flour. The cause is, perhaps, difficult to explain, but it would seem preferable to use millstones on pure stock, which would also tend to reduce the first cost of a mill plant where stones are already existing. French stones, which are perfectly suitable for grinding wheat, may not be suitable for grinding dunst. The latter requires stones of close grain, which can easily be adapted to the new work by making the land narrower and improving the ventilation. An open stone could not be made to do good work on dunst.

If good stones are available in a mill, only two pairs of smooth rolls would be required for the reduction of middlings and tailings, each with a centrifugal or reel, and they could be used alternately on the different qualities of middlings. The rolls must, of course, be of sufficient size to do the work in a given time, so as to have them ready for other material to be treated during another period, and before the products of a fresh supply of wheat reach the hoppers over these rolls.

One difficulty in working a periodical mill would seem to exist in dressing different qualities of flour through the same machine at different times, but it will be observed that the dressing machines gradually dress the flour from the head to the end of the plant, and the machines would only require cleaning out after the last reduction. Further, as we have at least as many dressing machines as we make grades of flour, it is very simple to connect all the machines so that we can dress each grade in its own centrifugal or reel.

When we have thus arrived at the end of all the operations, and converted all the stock into flour, which is automatically carried to the flour bins, there is the mixing of the flour form the different periods left to be done, for which automatic mixers would be used in a similar way to the automatic wheat mixers below the wheat bins, giving every facility to obtain a regular mixture.

From the above it will be seen that a mill of this system can be made to produce the same high grades, and in the same percentage, as any large automatic mill with a few machines only, but also that the system is easily adapted to the variation of available power. Even with the most reduced power we are able to drive some of the machinery at full speed, while on the other hand, when we have plenty of power, we can run a fresh supply of wheat on the first periods while we are finishing the stock from the previous supply on the smooth rolls and stones. Waiting until the last particle has left the last machine while the full power is available would be a waste of time, power and interest on capital invested in machines.

Now as regards the labor, it is also evident from the above that it is confined to the re-adjustment of the rolls when changing the periods, and the change of a few slides in the spouts. If the length of one period is one day, surely the work is not more than that in an automatic mill plant. In Continental mills on the periodical system the intermediate products are taken into sacks and fed into the corresponding machines by hand. This, of course, means a large amount of labor, and requires more men; but if, as I propose, these intermediate products are stored in bins connected with the machines, that extra labor is avoided. There is hardly more skill required to work such a mill than is required in an automatic mill, but the foreman will often find the work more satisfactory, a he is not so much dependent on the m

chinery. A blocking up of one or the other machine scarcely occurs, and if it occurs, is not of so much consequence as in an automatic mill.

In the above I have kept in view the rendering small mills capable of producing equal results to those of large mills; any small miller who will try the system which I have proposed will be able to arrange it to suit the demand of his market, and will soon satisfy himself by his own experience that it will answer in every respect, and secure him orders that will keep his mill going as long as he has power to drive it.

THE ANNUAL CONVENTION OF PENNSYLVANIA MILLERS.

ON Oct. 7th and 8th the 13th annual convention of the Pennsylvania Millers' State Association will be held at Reading, Pa. It was at first decided to hold the convention at Williamsport, but the place of meeting has been wisely changed to Reading. This will be good news to a large number of millers who have heretofore found the places of meeting inconveniently far away, and will, without doubt, result in the attendance of many who have not been present at the meetings, while still keeping up their membership in the organization. Let every miller who can by any possibility get away be present. Let the stay-at-homes bear in mind what they missed last year, and be on hand this time. Arrangements have been perfected by which the Reading Railroad will sell excursion tickets at reduced rates, and orders for these tickets can be secured by writing to the Secretary of the Association, Landis Levan, Lancaster, Pa. The superb service of this road assures a pleasant trip to all who attend, and its train service is all that the most exacting traveler could desire. Persons coming from points west of Harrisburg or Columbia, or from places not reached by the Reading system, but which are tributary to the Pennsylvania road, can likewise obtain orders entitling them to reduced excursion rates to Harrisburg or Columbia, whence advantage of the low rates over the Reading road to Reading can be taken. Application for these orders should be made to Mr. Levan at an early date, so that he can estimate on the required hotel accommodations, etc. A circular giving other important information is now being prepared; it will be mailed to all members in good time. The session will open at 3 P. M., and it is hoped that a large attendance of "dusties" and their friends will be present at that time to boom the Pennsylvania Millers' State Association when the curtain goes up on its thirtieth annual convention.

There is no doubt that this meeting will be fully up to the best that have preceded it. The officers have done their part in providing for very interesting and useful sessions, and let the millers do their part by showing that they appreciate the efforts of the officers.

Among other interesting reports and papers to be read at the convention, the following topics will be treated by the different writers as set forth:

"The Milling Industry in Pennsylvania. How Can It Be Made Profitable?" W. Latimer Small.

"Options. What Are They, and of What use to the Millers?" Wilson Welsh.

"Freight Discriminations. How Do They Operate Against the Eastern Millers?" G. A. Dayton.

"Credit. Its Uso and Abuse." B. F. Isenberg.

"Pennsylvania Millers' Insurance Company. Has it Benefitted the Millers?" J. M. Maguire.

"Millers' Associations. Have They Been of a Pecuniary and Social Advantage?" Hon. Cyrus Hoffa.

Reading is one of the most beautiful cities in the State, and now that it has two gravity roads over the mountains, giving the visitors magnificent views for thirty miles in different directions, it is considered one of the most popular places in the country for the entertainment of visitors.—*The Millers' Review.*

ROUMANIAN AND MOLDAVIAN BREAD.

BY EUGENE LEGER.

IN Moldavia, bread properly so called is eaten by the well-to-do, and even there on the best tables, by the side of the *bouhé* or national soup, is generally placed the dish of *mamaliga*, which is maize flour in water. The mamaliga is made by putting the maize in handfuls into boiling water and stirring it with a stick until it becomes compact. It is then a yellow pulp which sticks to the palate, and is swallowed with difficulty.

To make it smoother the Roumanians take it in their hands and knead it until it has lost its stickiness. This operation is not by any means graceful or pleasant to an Englishman. Mamaliga constitutes almost the exclusive food of the Roumanian and Moldavian peasant. It is true that on feast days he sprinkles it with grated cheese or steeps it in milk. When he comes to town his embarrassment is to find mamaliga. His stomach is so accustomed to the paste of maize that any other nutriment is insufficient. The mamaliga possesses one great advantage over bread, inasmuch as its manufacture does not require an oven or fuel, and the accompanying features of oven builders and coal merchants' bills.

When one meets peasants in the morning on the way to the fields, the first, generally carries on his shoulder a kettle, and the second a sack of maize. With three sticks and a few handfuls of dried grass the day's bread is prepared in a few minutes. In traveling, when a halt is made around a fountain or well, a stick is passed through one of the cartwheels, the kettle is hung upon it, a few handfuls of hay are kindled, and five minutes later the mamaliga is ready. Nothing is more convenient for troops on the march than instantaneous panification, and I can better understand the invasions of Attilla and other barbarians since I learned their method of nourishment. An army subsisting on wheat bread could never have journeyed from the recesses of Tartary into Europe without perishing of hunger on the way; but an army supplied with mamaliga could travel round the world. Two stones for grinding the maize and a kettle in which to boil it are the only requirements, whereas the consumers of wheat must necessarily be supplied with a mill, a bolting machine, a ferment, an oven, in a word with a considerable and and inconvenient amount of baggage.

WHY ROLLS RUN HOT.

Writing on the hot-rdnning of rolls, an English miller says: The heating of rolls may be traced to many causes, the first one of which is overloading and attempting to do too much work upon a given surface. If a roll is overloaded it will do far less work than where it has its legitimate feed, and there is also much greater liability to caking. The material in a horizontal roll should never be delivered directly into the center of the roll, for the reason that in so doing it is liable to drift in spots and bunches. The most perfect delivery of material upon rolls is the laying of it upon the surface of one of the rolls in such a manner that it will spread itself. In horizontal rolis I have often stopped the "growling," so-called by putting in a deflective board in such a manner that, instead of the feed dropping down into the center of the roll, it is delivered over on the side of the roll. This spreads it more perfectly, and instantly the growling ceases; and not only that, but the grinding will be found to be very greatly improved, and very much more of a reduction performed. It will also be found that the rolls may be set further apart, and at the same time perform their function, for the reason that whenever material is passing in bunches the set must be so as to permit the rolls to spring forward when forced open by passing over the elevated points. In relation to the perfect delivery of feed upon a roll, there can be little doubt that in a roller-mill, constructed with one roll above another, whereby the material is delivered substantially at right angles with the roll, the spreading of the material is thereby greatly assisted, and this advantage will go a great way toward making the two-high roller-mill the standard mill of the future, for the most perfect distribution of the stock over the entire surface is the most neglected, yet most important, element in roller-mills.

NEWS.—THE Opelika Flour Mills has been organized at Opelika, Ala., with a capital of $25,000 for the purpose of erecting a flour mill with a capacity of 300 barrels per day.

JAMES DUNN, miller, of Mifflinton, Pa., is dead.

M.B. Finch will build a 50-barrel roller mill at Woodstock, Va.

THE Faith Flouring Mill Co., is building a 60-barrel mill at Faith, Minn.

THE firm of Wm. Lees & Co., millers at Perrysburg, O., have dissolved.

JACOB S. GROFF succeeds Milton Royer in the milling business at Rudy, Pa.

SIMONDS & YERKES, millers at Northville, Mich., have dissolved partnership.

T. B. SMITH has purchased the flour mill of Geo. Lucas & Son, at Uhrichsville, O.

C. B. ROUTZAHN succeeds Routzahn Bros. in the milling business at Franklin, O.

DAVOLL & LAVAN are successors to L. F. Davoll, miller at Drayton Plains, Mich.

LINK BROS. have removed their milling plant from Charleston, Ill., to Springfield, Mo.

THE Jefferson Flouring Mill Co., of Jefferson, Ore., have filed articles of incorporation.

PAYTON & MITCHELL, millers at Guthrie Centre, Ia., are succeeded by Geo. S. Mitchell.

A 15,000-bushel elevator is being built for Hoover & Bonham, millers at Halstead, Kan.

SHIPE & JONES of Hankinson, North Dakota, have about completed their new 100-barrel mill.

THE Cadwallader Milling Co., of Fostoria, Ohio, are building a 50,000-bushel grain elevator.

THE contract for a new 40-barrel roller mill at Portland, Pa., has been let by Samuel Raesley.

BOUTWELL & SONS' flouring mill at Troy, N. Y., burned August 14th, was insured for $32,000.

WILCOX & HYDE, millers at Joliet, Ill., have dissolved partnership. L. H. Hyde is successor.

CHISHOLM & KENNEDY, millers at Chippewa Falls, Wis., have been succeeded by David Chisholm.

THE flour mill of Morris & Walsh, at Wilkes Barre, Pa., was damaged by the cyclone of August 19.

AT Low Hill, Pa., Aug. 29, grist mill of Peter George was burned. Loss $5,000; small insurance.

THE failure of D. C. Imboden, a prominent Kansas City grain commission man has been announced.

AUGUST 15, at Ashland, Mo., the Ashland Roller Mills were burned. Loss $15,000; insurance, $8,000

AT Waterville, Kan., Aug. 25, the Riverside Mill was burned. Loss about $12,000; insurance not known.

W. C. MANSFIELD & Co., of Cleveland, Tenn., have incorporated under the style of Mansfield Mill Co.

RICHMOND & SMITH, millers at Canandaigua, N. Y., have dissolved partnership. Chas. S. Smith succeeds.

JOHN G. SCHAUPP is remodeling his mill at Arcadia, Neb., and will considerably increase its capacity.

FIRE at Grafton, S. D., August 22, destroyed the elevator of the Union Elevator Co. Loss $10,500; insured.

THE Pacific Elevator Co., of Minneapolis, Minn., has filed articles of incorporation. Capital stock $150,000.

IT is reported that the Alma City Mill Co. of Alma City, Minn., have moved their mill to Elkhorn, South Dakota.

ARTICLES of incorporation have been filed by the Emporium Milling Co., of Emporium, Pa. Capital stock $60,000.

WILFORD BROS. & Co., at Bowling Green, Ky., have increased the capacity of their flour mill from 150 to 200 barrels daily.

THE flour mill at New Paris, Ind., formerly owned by Rodibaugh & Son, is now owned and operated by Thomas Clayton.

THE Hartman-Ketterer Milling Co., Odebolt, have leased their mill and elevator property and are gradually going out of the business.

destroyed, besides two carloads of flour. Total loss $25,000; insurance, $20,000. The property will be rebuilt.

AT Mankato, Minn., Aug. 31, R.B. Hubbard & Co.'s elevator, with 40,000 bushels of wheat, was burned. Loss $50,000; insurance $40,000.

THE Champion Roller Mill Co., of Piqua, Ohio, are building a 100-barrel mill for the exclusive manufacture of Cones patent germ flour.

AT Loudenville, West Virginia, the Loudenville Milling and Manufacturing Co., has been incorporated with a capital stock of $4,000.

W. T. CONN & Co., have bought the Oconee mills at Milledgeville, Ga. The mills have been overhauled and the capacity greatly increased.

ADAM FRANTZ, of the firm of Jones & Frantz, millers at Wilkes Barre, Pa., was killed during the terrible cyclone which struck that town August 19.

THE SweetWater Mill Co., at SweetWater, Tenn., have, by the addition of new machinery, increased the capacity of their mill to 400 barrels per day.

THE Batesville Flour Mill and Manufacturing Co., lately organized at Batesville, Ark., will build a 75-barrel roller flour mill. Their capital stock is stated at $25,000.

FRED J. SCHUPP of Marceline, Mo., whose flour mill was recently burned, is rebuilding and when completed the new mill will have a capacity of 100 barrels per day.

SEPT. 2, at Eau Claire, Wis., the Acme Flouring Mill, owned by M. E. Britton and Ira Wescott, was burned; also a part of Britton's residence. Loss, $5,000; insured.

WILLIAM M. DRULY & BROS., Joliet, Ill., grain merchants, with elevators, at Plainfield and Caton Farm, were closed by the sheriff September 2. Reported liabilities $50,000.

THE milling firm of Hinkle, Greenleaf & Co., at Minneapolis, Minn., has been dissolved. Mr. Greenleaf retires and the business will be continued by the Humboldt Milling Co.

THE Kittanning Milling Co. has been incorporated at Kittanning, Pa. Capital stock, $20,000; Directors: J.A. Gault, J.A. Colwell, W. J. Patton, A. J. Borta and H. A. Gault.

THE Woestman Milling Co., has been incorporated at Nashville, Tenn. Capital stock $50,000; the incorporators are John R. Woestman, W. H. Wulze, H. H. Cordes, and others.

AT Chicago, Ill., Aug. 22, Sidney B. Johnston's grain elevator, a three-story frame building at Baker street and Steward avenue, was damaged $6,000 by fire. The contents, grain and machinery, were damaged $600. The building was insured.

THE Ajax Milling Company at Gallatin, Tenn., has been organized with a capital stock of $50,000, and will apply for a charter. J. W. Smith, John M. Cantrell, F. F. Pierce, J. B. Alexander, J. B. Howison and B. D. Bell are the incorporators.

THE Liberty Mills, Nashville, Tenn., was recently granted a charter. The mills will have a daily capacity of 100 barrels and a capital stock of $100,000. The incorporators are E. M. Kelley, W. C. Collier, E. F. Nenon, E. C. Andrews, E. C. Faircloth, Fred Zickler and M. S. Pilcher.

A PLAN is on foot at Montgomery, Ala., to build a flour and grist mill to replace the one burned some three or four years ago. A stock company is to be formed with a capital of from $100,000 to $150,000 in which every merchant in town will be interested according as his business justifies. Mr. J. F. Joseph is interested in the project.

AT Weston, O., Aug. 23, the grist mill operated by J. H. Biddle and elevator owned by Franklin & Woodissee were burned; Loss $14,500; insurance $5,000, divided as follows: loss on the grist mill $9,000, on contents $1,000; insurance, $1,000. Loss on elevator $3,000, contents $1,500; insurance $4,000. Groff & Wood, who owned the mill, were the heavy losers, as there was only $1,000 insurance. The mill was rented to J. H. Biddle.

WILLIAM ELWELL, the senior member of the firm of Wm. Elwell & Son, millers at Sheboygan, Wis., died Sept. 4. The deceased suffered for two years from softening of the brain and had been confined to his bed for about a month previous to his death. Mr. Elwell was born at Towanda, Bradford Co., Pa., in 1834, and was married at same place in Feb'y 1861, to Helen M. Spaulding who died several years ago. Four children, Helen M, William S., Robert S. and Heura survive him.

AUGUST 24, the large elevator and warehouse operated in connection with the Aberdeen Roller Mill at Aberdeen, S. D., was burned. The fire was caused by spontaneous combustion. The building was attached to the mill and it was with considerable difficulty the valuable mill property was saved. Loss on elevator $8,000. Between 12,000 and 20,000 bushels of grain, mostly wheat, was

KENDRICK, PETTUS & Co., of Clarksville, Tenn., will remodel their flour mill and put in new machinery at a cost of $6,000.

ELECTRIC-LIGHT FIRES AND INSURANCE.

AT the annual meeting of the National Board of Fire Underwriters in New York on the 8th of this month, several very interesting papers upon important topics affecting the welfare or illfare of the business were presented.

An extract from the newspaper reports of that meeting reads as follows:—"The most interesting report came from the committee on lighting and heating, read by Chairman John H. Washburn. The great problem before us to-day, he said, is the management of the various systems of electric lighting, which is not the harmless thing we had imagined, but a most prolific source of danger. It has come to stay, however, and in time it will probably be as safe as any light in use. With the report a graphic diagram was handed in, which showed that while electric wires and lights were responsible for losses of only $460,000 in 1886, the value of property injured by fire which could be traced to the same source, in 1889, was $5,533,000."

Such a report coming from a body representing, as its name implies, the Fire Underwriters of the Nation, conveys to the public the idea that "the relation between fire insurance and electric interests from the underwriter's standpoint" is a very gloomy one for the former.

I was sorry to see such a bold statement go forth without any explanation as to how it was arrived at, or what it indicated. If it was intended to indicate, as it certainly does to every person not acquainted with the facts, that the danger of fire from electrical causes had grown to be twelve times greater in 1889 than it was in 1886, it is shamefully unfair because it is untrue.

As the figures given are identical with those contained in the "Chronicle Fire Tables" published by the Chronicle Company, of New York, I presume they came from that publication, and therefore it is fair for me to draw from the same source to show how unfair the report really is.

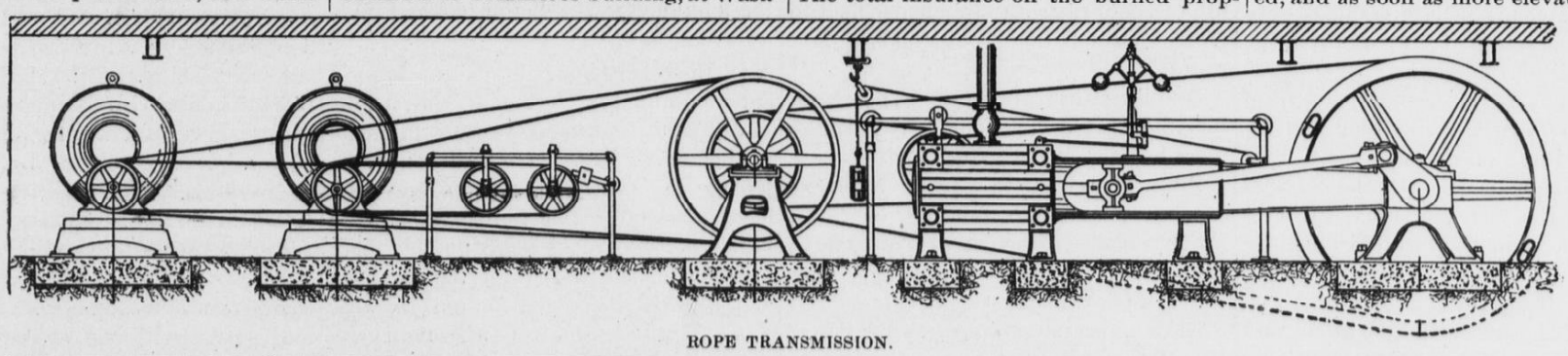
Those tables show that in 1886 there were 29 fires from "electric wires and lights", causing loss of $460,000; in 1887, 66 fires and $681,000; in 1888, 91 fires with $1,587,000 loss; and in 1889, — fires with $5,533,000 loss.

The yearly increase in the number of fires reported is nowhere near the percentage of increase in the use of electric light and wires, therefore the number of fires was not used to show the comparative hazard by years. It looked much more startling to use the amount of loss and for that reason I presume it was used; I can see no other reason for using it. But where did the great increase in amount of loss come from? Why, from the Boston fire of Thanksgiving day, which "everybody says was caused by the electric wires," but which nobody has proved. The fire marshal in his investigation exhausted his energies and all means at his disposal, and certainly the bulk of the testimony taken would naturally lean towards fixing it upon the electric wires. The Massachusetts insurance commissioner in his 1889 Report just issued, says, "the preponderance of the testimony seems in favor of the theory that it was caused by the electric wires"; therefore, in his opinion (which is good enough for me), it is a "theory" that confronts us and not a condition nor a fact. That loss amounted to about three millions and a half. It was injected into the destruction account of "electric wires and lights," making the account four times as large as in 1888, and yet, admitting the right to charge the fire to that account at all, it only increased the number of accidents by one. Supposing the fire had got still further beyond the control of the firemen and had destroyed one hundred millions instead of three and a half? Of course, it would have proved (according to the logic of the report of the National Board) that electricity is twenty-two times as hazardous as the report makes it out to be.

Those of us who know what peculiar and improbable conditions must exist in order for the "electric wires" to cause fires, can only look on and hope. Enlightenment comes slowly but surely, and the day is not far distant when the large majority of fire underwriters, forgetting their present ideas, will say, "I always maintained it was the safest kind of light and power." In the meantime the present rapid development will go on regardless of the underwriter's standpoint. A few years ago his favor or opposition meant easy or slow progress for the electrical pioneer, because the first question asked was, "how will your wires and lights affect my insurance?" But the business has "come to stay" and that question is less frequently asked. The same difference, however, exists to-day that always did exist between good and poor insulation, and therefore it should be the aim of the electrical men to seek the co-operation of the underwriters in securing the observance of safe fundamental rules.—*Stephen E. Barton.*

AN EXAMPLE OF ROPE TRANSMISSION.

THE Link-Belt Machinery Co., Chicago, recently designed and erected a complete Rope Transmission plant for driving dynamos in the Chamber of Commerce building, at Washington and La Salle sts., Chicago. There are two 150-h.p. Corliss engines, each driving independent jack shafts. From each of these jack shafts are driven two 800-light Mather dynamos.



ROPE TRANSMISSION.

The accompanying engraving is an elevation of one of these drives, and shows the engine connection to the jack shaft and the Link-Belt Machinery Co's, suspended single track tension carriage. The sheaves that drive the dynamos are each provided with disk friction clutches, so that either or both dynamos can be run at will.

This method of driving dynamos is rapidly becoming popular with electricians, as it is possible to obtain a much steadier light with ropes than with belts, and the almost absolute quiet with which they run recommends them to the owners of buildings.

ANOTHER SPRINKLED RISK BURNED.

FIRE underwriters were much interested Wednesday by the news that the stone flour mill of A. A. Freeman & Co., destroyed by fire at La Crosse, Wis., August 9, was a sprinkled risk. The plant was entirely equipped with the Grinnell automatic sprinkler, 552 heads in mill, elevator, boiler and engine house. It was the dry-pipe system, with two sources of water supply, viz., the city main, which is 10-inch, with a 6-inch supply pipe to basement of mill, and a 4-inch pipe from basement wall to riser; also, a 4-inch supply pipe from the Blake fire-pump to riser. The mill building was of stone with iron roof, containing easy access to roof by staircase from inside and stationary iron ladder from outside; walls were about 7½ to 4½ feet thick at bottom, starting on solid pile foundation and running out 18 inches at top; built in 1875–1876; 65 feet wide by 80 feet deep; six stories high. The elevator was built of cribwork, with iron roof and sidings, situated on the northwest corner of the mill. Power to drive same was obtained from main line shaft in basement of mill. There were openings between mill and elevator protected by iron doors. No smoking or spirituous liquor drinking was permitted on the premises, and a night watchman was employed, under control of an Imhauser clock. The smut machines, grain separators and other grain-cleaning machines were located outside of the mill building. The dust therefrom was blown in a separate dust room outside of the mill; the lighter part of the dust was blown out promptly and balance cleaned out when necessary. Burrs were six pairs and ran about 150 revolutions per minute. The middlings purifiers were of improved and simple patterns, running with little friction. For extinguishing fire the mill had a Blake special fire-pump, operated by steam from main boilers, capable to throw from three to four hundred gallons of water per minute. This was connected with an iron stand-pipe of four inches diameter, running near the center of mill buildings to the top story of mill, and had attachments on each floor of about 100 feet of hose. The assured had also a cask of water on each floor, with buckets near each, ready for use, and situated in accessible places; further, a Babcock fire-extinguisher on several floors. Hydrant of city water works within one block's distance. Two additional standpipes connecting with city water works. The total insurance on the burned property amounted to $160,000, at a 3¼ per cent. rate, divided as follows: Among 45 stock companies $100,000, and among mutual companies as follows:

Millers' National Insurance Co. of Chicago	$10,000
Manufacturers' & Merchants' Mutual of Rockford	10,000
Mississippi Valley Mutual Insurance Co	7,500
Mill Owners' Mutual of Des Moines	10,000
Millers' & Manufacturers' Mutual of Minneapolis	5,000
Protection Mutual Fire of Hyde Park	7,500
Western Manufacturers' Mutual Insurance Co.	10,000
	$60,000

The origin of the fire is supposed in La Crosse to have been spontaneous combustion, though there was no appreciable explosion. When the insurance was procured the assured stated that oily waste was cared for in metal cans and burned as often as necessary; that conveyor boxes would open automatically if choked up, and that elevator heads were made self-cleaning. The particulars as to why the sprinklers did not extinguish the fire were not obtainable at this writing, but it is thought by experts that the flour dust, etc., might have clogged up the mechanism of the sprinkler heads. The explanation of the reason why the fire got away from the sprinklers will be awaited with interest.

WESLEY CARTER & Co., of St. Cloud, Minn., have completed their new flour mill. The building is 40x80 feet in size, and three stories high, with a basement, and is fitted out with modern improved machinery, making a very complete 100-barrel roller mill.

NEW ORLEANS AS A GRAIN EXPORTING POINT.

ALTHOUGH cotton continues to be the largest and principal article of export, strenuous efforts have been made of late years, not only to increase this cotton business, but to augment the movement of other products to foreign countries via New Orleans. Thus there has been a substantial gain in nearly all articles, but the export movement of grain has shown special signs of substantial improvement.

The recently published report of the Board of Grain Inspectors of New Orleans showed that during the past commercial year there were exported from this port to foreign countries 14,156,199 bushels of corn, against 12,918,056 during the preceding year, showing an increase of 2,238,143 bushels. Of wheat the exports amounted to 1,739,788 bushels against 885,957 bushels during the preceding year, a gain of 853,631 bushels. The rye exports were 171,369 bushels, against none at all during the preceding year.

This increase is made the more striking by comparing it with the years preceding the season of 1888-89, as that was a year of great progress in the grain exporting trade. This gratifying increase in the export movement of grain at this port was in a measure the result of the very large corn crop, but it was also largely due to the improved facilities prevailing here. The handling of the bulk grain by rail became a pronounced feature during the past year, and the increase in exports is largely due to that cause.

Previous to the past season nearly all the grain intended for export came here in barges from St. Louis, but the erection of the grain elevator at Southport started bulk grain in cars in this direction, and for a first season the movement was extremely large. This handling of grain for export by the railroads has thrown open to the influence of this port large sections of country that had not before been reached, and as soon as more elevators are provided a further development of this movement may be looked for. The great success of the elevator at Southport cannot fail to stimulate the erection of other establishments. With a splendid deep-water harbor, ample tonnage and cheap freights, this port offers exceptional facilities for grain shipments provided the necessary elevator facilities are secured. —*N. O. Daily Picayune.*

WILL IT AFFECT EXPORTS?.—It is frequently stated that the effect of the advance of 25 to 30 per cent. in silver values will reduce the movement of wheat from Russia and India. We have no doubt of some ultimate effect in that line, but we cannot forget that the poor producer everywhere at the mercy of the buyer, and he must take what he can get. Odessa and Bombay dealers, like export dealers at all other seaports, will not continue to pay for wheat a price that will entail sure loss, and thus the effect extends to the interior. The producer will squirm and wait awhile, but finally he will be pushed to sell. That is our theory on that question. Meantime, the importing countries give no evidence of solicitude about future supplies.—*Toledo Produce Exchange.*

WE shall be pleased to receive from any of our readers, short, crisp, sensible letters on subjects of interest to the flour and grain trade for publication.

FLOUR.

A Lecture Delivered Before the Natural History Society at Montreal by Professor J. T. Donald, A. M.

Flour may be defined as grains of wheat separated from the outer husk or covering in which the seed is enveloped, and reduced to powder. The term "flour," when used without a qualifying word, is understood to be wheaten flour, flour of other grains having the names of the grain prefixed, thus: rye flour, corn flour, etc.

In order to fully understand our subject we shall have to begin with its source, the grain of wheat, and then, since the quality of a flour is usually judged by its suitability for bread making, we shall necessarily have to refer to bread, so that our subject becomes a somewhat wide one.

We are all familiar with the grain of wheat and its structure, its firmly adherent fibrous coat, with the fine hairs at one end and the germ at the other. Within is a mealy portion composed of a large number of cells, containing principally starch and gluten, with smaller amounts of oil and mineral matter. It is the object of milling to reduce the floury portion of the grain to a fine powder without injuring its physical condition, and at the same time excluding all portions of bran and germ which would injure its color and baking properties.

We gain some idea of the magnitude of the miller's task when we consider the size of the grain of wheat. In one bushel we have about 700,000 grains, and in order to obtain 100 pounds of flour not less than a million and a half of these grains must be treated.

As has been said, the principal substance found in the grain of wheat which are to be excluded from flour are the husk or bran and germ. The fibrous irritating nature of bran and its indigestibility are well known. As to the germ or embryo, we must remember that the grain, except outermost coverings, is a seed, and the germ is the young wheat plant already formed in the seed and only awaiting the proper conditions to sprout. In all seeds provision is made for the nourishment of the embryo until it is so strongly established that it can take care of itself. This store of food is usually in the form of starch, but the young plantlet can only take in its food in the form of mucilage or thin syrup. There is, therefore, associated with the germ a ferment, as it is called, which has the power to convert starch into a mucilaginous product. This power it exerts whenever the seed obtains moisture and warmth. This is well seen in the process of malting, where the grains of barley are caused to sprout and then killed by application of dry heat. The starch of barley is found to be largely converted into a syrupy substance.

Now, if the germ be allowed to enter the flour its associated ferment acts upon the starch, producing a sticky mass, with which it is difficult to obtain a light loaf of good color. In the bran, too, there is a ferment which acts in a similar way. Both, therefore are to be excluded as fully as possible from the flour.

The old method of milling consisted in finely grinding the wheat between stones, and then by a system of sifting, separating the branny matter from the floury portion. Next came high grinding, with stones far apart, only bruising or crushing the grain; then, after separating the husk, grinding the purified mealy portion (middlings, as it is called) between stones. Within the last ten years a great change has come over the milling industry, and but few stones are used, their place being taken by sets of iron or porcelain rolls. This system is known as the "Hungarian," as it was first brought to a high degree of perfection in that country. It is also termed the "gradual reduction" process. This mode of milling has practically superseded all others in Canada and the States.

The grain is first subjected to an elaborate process of cleaning, scouring bruising and blowing, all being employed. In some cases wheat is split along the crease and then cleaned, but as methods of cleaning become improved this splitting is omitted.

The cleaned grain is then passed through a series of rolls, by which means the floury portion of the grain is gradually reduced in fineness, and then by purifying machinery separated from husk and germ. The granulated meal, or middlings, is then ground between rolls or stones, as the case may be. Experience has shown that 135 pounds of wheat will yield 100 pounds of flour variously graded, the remaining thirty-five pounds being cattle feed and waste in milling. Let us now note the composition of wheat, and also flour from same wheat, to perceive the changes undergone in milling, and to credit each ingredient with its proper function:

	Wheat ready for rolls.	Flour, stright rolls.
Water	9.07	11.83
Ash	1.74	.51
Oil	2.74	1.72
Carb. hydrates	70.37	71.79
Fibre	1.68	.26
Albuminoids	14.35	13.91
	100.00	100.00
Gluten	11.88	13.01

Let us see that we understand the terms used in the analysis. Ash mineral matter, which represents food for formation of bone, is chiefly phosphates. Albuminoids are very valuable ingredients of flour and consist chiefly of what is called gluten. We may form an idea of the nature of gluten by considering the difference between starch and flour. Starch, when moistened with cold water, forms a mass which is brittle and crumbles, whereas flour when so treated forms an elastic mass. The cause of this elasticity in flour is in the gluten, and wheat is the only one of our cereals containing any notable amount of it. Now, the gluten is the body whose tenacity and elasticity when in the dough enables it to hold the bubbles of gas which are formed in process of rising, and flour deficient in gluten cannot therefrom make light bread.

It follows that gluten is a necessary ingredient of a flour, for some purposes more being required than for others.

But now we come to a point where we can understand the grading of flour. Flour is graded principally on two points, viz: strength and color; the stronger and whiter a flour the greater its value. But what is understood by *strength* of flour? It is the capacity to produce a well-risen loaf. In other words, a strong flour is one which possesses a large quantity of gluten of good quality; a flour that is not strong is low in percentage of gluten.

Now, it so happens that, whilst gluten is scattered through the entire floury part of the grain, it is present in greatest quantity in the portion next the husk, the very part which is also richest in oil and mineral matter. The outer part of the grain differs from the inner or central part in degree of darkness, so that it is not very difficult for the miller to separate the two portions and obtain a flour compound principally of the outer part and another which represents the inner floury portion.

In the process of milling the flour from the outer part of the grain becomes more or less contaminated with particles of bran, and is therefore darker in color than that from the interior.

From the roller mills usually three grades of flour are produced in about the following proportion: "Strong baker's," 54 per cent.; "patent," 40 per cent.; "low grade," 6 per cent. The "strong baker's" is the flour from exterior portion of the grain, containing a large proportion of gluten, somewhat dark in color on account of presence of branny particles and also because of comparatively high percentage of oil matter. It is used principally by bakers for producing the ordinary brown loaf, its large amount of gluten allowing production of large loaves which may be baked without pans.

"Patent" is the flour from the inner portion of the grain, which contains less gluten than "baker's," but is whiter in color. It is used for making finer qualities of bread and for family use, the "strong baker's" being too strong, forming a mass that offers too much resistance to passage of gas to be suitable for fine pastry.

The "low grade" is a very hard flour, containing very little gluten, but considerable quantities of bran and germ are present. It is not used to any extent in bread making, but is used in manufacturing and as food for cattle.

Analysis of "strong baker's" and "patent" will show clearly the difference:

	S. baker's.	Patent.
Water	12.18	11.48
Ash	.62	.39
Oil	2.00	1.45
Carb. hydrates	69.99	73.52
Fibre	.33	.18
Albuminoids	14.88	19.25
	100.00	100.00
Gluten	12.40	9.20

The market value of these flours per barrel of 196 pounds is about as follows: "Strong baker's," $5.50; "patent," $5.75; "low grade," $2.00.

This grading is on flour made from hard wheats of the Northwest. Ontario wheats are softer and contain less gluten, and cannot produce a flour strong enough for bread making, but is well adapted for pastry and family use.

I cannot leave this part of my subject without taking up briefly the question of the relative values of Graham whole meal, entire wheat flour and white fine flour. Great and long-continued has been the controversy on this point. Time would fail me even to attempt to outline the arguments pro and con.

Woeful pictures have been drawn of children toothless and weak in the limbs, all because their parents would feed them on white flour. Pamphlets have been written on the folly of giving cattle the richest product of the mill and retaining the inferior though better colored products for man.

On the other hand, the advocates of the superior nutritive value of white flour have sought to draw powerful arguments in their favor from Scripture. They, referring to Abraham entertaining the angels, remind us that the patriarch bade Sarah, his wife, make ready quickly there measures of *fine* meal, implying that even at that early date a distinction in value was recognized, and the fine flour was best; also Psalms, "He should have fed them with the finest of wheat" (fat of the wheat.)

The whole controversy seems to have arisen simply through the neglect of the parties to the controversy viewing both sides of the question.

Since Graham flour is simply the cleaned wheat ground, the analysis of wheat is, to all interests and purposes, the analysis of Graham flour:

	Graham.	Patent.
Water	9.07	11.48
Ash	1.79	.39
Oil	2.74	1.45
Carb. hydrates	70.37	73.35
Fibre	1.68	.18
Albuminoids	14.35	12.95
	100.00	100.00
Gluten	11.88	10.85

We find fine flour to contain much less ash mineral matter or bone food, being only one-fifth in quantity and much less fibre.

Undoubtedly the fine flour would be a more perfect food did it contain a greater percentage of ash, but other foods supply this in sufficient quantity. Again, we find a higher percentage of albuminoids and gluten in the Graham; but it must be kept in view that along with this there is in Graham a very much larger amount of fibre, nine times the amount in fine flour. Now this fibre is bran and germ, and the presence of these in Graham flour is the weak point of such flour. As already pointed out, in both bran and germ there is a ferment which acts upon the starch and converts it in part into a sticky substance called dextrine. This excess of dextrine, to which is due the sweetness of Graham bread, causes the dough to become dark, soft and clammy, on which account the loaf is apt to become sodden and indigestible. Any one who has tried to make a Graham loaf knows how difficult it is to obtain a light loaf. The baker's Graham is only partly Graham.

Another objection to Graham flour is the presence of the branny particles, which, besides being unpalatable, cause irritation in the alimentary canal, leading to a quicker removal of the but partially digested food.

Taking all things into consideration, it is evident that white bread is really cheaper, weight for weight, to the poor man than the bread made with unbolted flour. Improvements are continually being made in milling, and in the near future it is probable we shall have a fine white flour containing all the nutritious matter of the grain and in the best physical condition.

SOME OF THE WORK THAT THE EDWARD P. ALLIS COMPANY RELIANCE WORKS, MILWAUKEE, WIS., ARE DOING.

The following are some of the recent orders received by the Edw. P. Allis Company:

King Milling Co., Lowell, Mich., complete 150-bbl. mill; Geo. Walter, Butler, Pa., complete 40-bbl. mill; Brown & Sehler, Grand Rapids, Mich., complete 50-bbl. mill to be erected at Conklin, Mich., for a farmers' organization; Toble, Boltz & Co., East Palestine, Ohio, complete 60-bbl. mill; Henry Ruseling, Elva, Wis., complete 50-bbl. mill; King, Edwards & Thomas, Ethel, Mo., complete 50-bbl. mill; James Marriott, Long Grove, Ky., remodeling 60-bbl. mill; O. S. Miller & Co., Champlin, Minn., complete 75-bbl. mill; J. P. Taylor Irwin, Pa., complete new bolting system for 125-bbl. mill; Moseley & Motley Milling Co., Rochester, N. Y., rebuilding 600-bbl. mill.; Shambaugh & Son, Shambaugh, Iowa, new bolting system for 50-bbl. mill; Marion Osborn, Bloomingdale, Wis., complete 50-bbl. mill; Detert Bros., Harrisville, Wis., complete 50-bbl. mill; Christian Bros. Mill Co., Minneapolis, Minn., complete new bolting system and 32 dble. 9x24 roller mills for 2,500-bbl. mill—no competitive bids invited; ——— mill, Minneapolis, Minn., complete new bolting system for 2,000-bbl. mill—name withheld at request of customer. No competitive bids invited.

ENGLISH, SCOTCH AND INDIAN FLOURS.—Flours from English wheats are usually soft and damp; they vary considerably with change of climate and locality; the proportion of gluten is low and devoid of much elasticity; the water absorbing power is low. Patent flours are of very good color and bloomy; bakers' grades are dark and gray. The loaf is small and compact; the crust of the better class of flours is free from "foxiness;" the bread is moist and has a very sweet, nutty flavor. Doughing flours are of all grades, and may be used alone, doughing direct. Scotch flours are even moister and softer than those of English wheats. Like them, they are low in gluten and water-absorbing capacity. The loaf is small, bread moist, and flavor pleasant. Doughing flours are of all grades, and may be used alone, doughing direct. Indian flours generally are hard flours of a ricy character; their gluten is low in amount, and usually very deficient in elasticity; the quantity of water absorbed is high; the color is low, except with very great milling precautions. The loaf is small and runny, devoid of texture, and "foxy;" the bread is harsh and beany in flavor.

AN alloy that expands in cooling, and is suitable for repairing cracks in cast iron, is made with nine parts of lead, two of antimony, and one of bismuth.

WOODEN FLOUR.

A CORRESPONDENT of the *N. Y. Tribune*, having for probably for the first time in his life discovered a wood pulp mill, makes it the ground work for the following sensational item which he doubtless expects the public to swallow, slivers and all:

At Mount Pleasant, N.Y., on the Ulster & Delaware railroad, is a mill that makes wood flour out of white-beach woo . The logs, stripped of bark, are forced against a cutting machine that makes 400 revolutions a minute. the thin shavings are dried and put into a hopper which grinds them into flour. The flour is bagged and sent to New York. Says a gentleman who visited the mill the other day: "A gentleman told me that there is a pretty big sale for the stuff. He said that a part of it was used as paper stock and in the preparation of linerusta walton. This is the ostensible purpose for which it is made, but a workman told me that a good deal of the stuff went into the hands of contractors for furnishing Indian rations, and that considerable of it went into the cheap breads sold in the Italian and Hebrew districts in the lower part of New York city."

In the meantime Prof. Victor Meyer in an address at Heidelberg, Germany, announced "that we may reasonably hope that chemistry will teach us to make the fibre of wood a source of human food."

In commenting on this authoritative statement *The Lancet* (London) takes occasion to say:

"What an enormous stock of food, then, will be found if this becomes possible, in the wood of our forests or even in grass and straw! The fibre of wood consists essentially of cellulin, $C_6H_{10}O_5$. Can this be made to change into starch? Starch has exactly the same percentage composition, but as every one knows, it differs very much in its properties, and the nature of its molecule is probably much more complex. Cellulin is of little or no dietetic value, and it is not altered, like starch in boiling water. It readily gives glucose when treated with strong sulphuric acid, as is easily shown when cotton wool, which is practically pure cellulin, is merely immersed in it. Starch gives the same product when boiled with weak acid. The author further quotes the researches of Hellriegel, which go to show beyond dispute that certain plants transform atmospheric nitrogen into albumen, and that this process can be improved by suitable treatment. The production, therefore, of starch from cellulin, together with the enforced increase of albumen in plants, would, he adds, in reality signify the abolition of the bread question. It must be borne in mind, however, that theory, fascinating and promising though it may be, is not always capable of being followed up by practical result."

Who knows then, but what in the near future the giant pulp mills of Northern Wisconsin will prove to be rivals in the production of human food, that will dismay the farmer and miller and bring joy and glory to the sturdy lumberman.

THE FRENCH WHEAT CROP.—The Paris *Bulletin des Halles* gives its annual estimate of the wheat crop, according to the reports it has received from various parts of the country. The approximate yield they put at 108,422,150 hects., but the quality is so defective and the waste from "laid" wheat so large that they consider that at least 7 per cent. must be deducted on this account. The actual yield of wheat suitable for milling is therefore put at 100,831,600 hectolitres, or 278,000,000 bushels, against 318,000,000 (the official estimate) last year. The *Bulletin des Halles* adds that the yield in flour from this year's wheat will be quite below that from last year's wheat. The annual consumption of wheat in France being estimated at 337,300,000 bushels, it would follow that 59,200,000 bushels will have to be imported from abroad.

THE WORLD'S WHEAT DEFICIENCY.—Beerbohm, in an exhaustive review of the wheat situation, reiterates his former statement that the supplies will fall 3,250,000 quarters below the requirements, and adds: This will have to be drawn from the already reduced reserves. It need hardly be added that in this latter point—small stocks—lies the great strength of the position; a comparatively small deficiency of 3,250,000 quarters would, for instance two years ago, when the reserve stocks of the world were perhaps 12,000,000 to 15,000,000 quarters larger than they now are, have been of small account; but, coming after a season like last, when over 10,000,000 quarters were drawn from the reserve to meet current requirements, it is not to be expected that a further inroad will be made without affecting prices.

ORGANIZATION OF MILLERS IN THE UNITED STATES.

THE MILLERS' NATIONAL ASSOCIATION.

President—A. R. JAMES, - - - - - - - - - Buffalo. N. Y.
1st Vice-Pres't—WM. SANDERSON, - - - - - - - Milwaukee, Wis.
21 Vice-Pres't—H. L. HALLIDAY, - - - - - - - Cairo, Ill.
Treasurer—S. H. SEAMANS, - - - - - - - - Milwaukee, Wis.
Secretary—FRANK BARRY, - - - - - - - - Milwaukee, Wis.

BOARD OF DIRECTORS.	STATE.	OFFICERS OF STATE ASSOCIATIONS.
*C. B. Cole, Chester	ILLINOIS	President, E. C. Kreider, Jacksonville. Secretary, C. H. Seybt, Highland.
M. S. Blish, Seymour	INDIANA	President, F. E. C. Hawkes, Goshen. Secretary, E. E. Perry, Indianapolis.
	IOWA	President, C. A. Consigney, Red Oak. Secretary, James Sharp, Des Moines.
C. R. Underwood, Salina	KANSAS	President, B. Warkentin, Newton. Secretary, W. T. Hopkins, Enterprise.
P. H. Macgill, Baltimore	MARYLAND	President, P. H. Macgill, Baltimore. Secretary, J. O. Norris, Baltimore.
*W. B. Knickerbocker, Albion	MICHIGAN	President, W. B. Knickerbocker, Albion. Secretary, M. A. Reynolds, Stanton.
*A. C. Loring (chairman), Minneapolis	MINNESOTA	President, F. L. Greenleaf, Minneapolis. Secretary, W. C. Edgar, Minneapolis.
Geo. H. Plant, St. Louis	MISSOURI	President, S. M. Carter, Hannibal. Secretary, H. C. Craft, St. Louis.
C. C. White, Crete	NEBRASKA	President, O. A. Cooper, Humboldt. Secretary, D. H. Harris, Bennett.
*Geo. Urban, Buffalo	NEW YORK	President, A. R. James, Buffalo. Secretary, H. F. Shuttleworth, Buffalo.
Jno. M. Turner, Mandan	NORTH DAKOTA	President, J. S. Hillyer, Bismarck. Secretary, J. M. Turner, Mandan.
Homer Baldwin, Youngstown	OHIO	President, Homer Baldwin, Youngstown Secretary, M. H. Davis, Shelby.
W. Latimer Small, York	PENNSYLVANIA	President B. F. Isenberg, Huntingdon. Secretary, L. Levan, Lancaster.
W. H. Stokes, Watertown	SOUTH DAKOTA	President, L. G. Beynon, Brookings. Secretary, C. A. Lum, Aberdeen.
*Wm. Sanderson, Milwaukee	WISCONSIN	President, E. J. Lachmann, Neenah. Secretary, L. R. Hurd, Milwaukee.

* Members of Executive Committee.

ENGINES FOR ELECTRIC LIGHT AND POWER PLANTS.—The Lane & Bodley Company, Cincinnati, O., during the week ending June 6, received orders for one 500-horse-power high pressure Corliss engine for the Des Moines Electric Street Railway Company, Des Moines, Ia.; one 500 compound condensing engine, with surface condenser, for the Cincinnati Electric Light Company, Cincinnati, O., and one 400-horse-power for the Evansville Gas and Electric Light Company, Evansville, Ind. Three such orders in one week show not only the demand for engines by electric light and power companies, but also the enviable reputation of this old company, which has been in the business more than half a century.

Robert Dunbar died in Buffalo, N. Y., September 17, aged 77 years. He was an expert mechanical engineer, proprietor of the Eagle Iron Works, and was the father of the present system of grain elevators. He built most of those in Buffalo; also designed elevators at Liverpool and Hull, Eng., and Odessa, Russia, besides New York and other points in this country and Canada.

ARE ADVERTISEMENTS READ?

Years ago, when Henry Grady was struggling to bring the Rome *Commercial* into the front ranks, says the Rome (Ga.) *Tribune*, he called one day and asked the Rounsaville Brothers for an advertisement. J.W. Rounsaville replied: "Why, Grady, nobody reads your paper; it is no use to advertise in it." A happy thought suggested itself to Mr. Grady. He went to his office and wrote the following advertisement, which appeared next morning in the *Commercial:* "Wanted, fifty cats. Liberal price for the same. Apply to the Rounsaville Brothers." Well, the picture that presented itself at Rounsaville's corner next morning beggars description. Boys of all ages and sizes—boys of all tints from the fair-haired youth to the sable Ethiopian—bare-footed boys and ragged boys, red-headed boys, freckled-faced boys—town boys and country boys—boys from all parts of Floyd county blocked up the sidewalks, doorways and street with bags full of cats—cats of every description, name and order—house cats, yard cats—barn cats, church cats—fat cats and lean cais—honest cats and thievish cats. Well, to make a long story short, the Rounsavilles told Mr. Grady to reserve a column for their advertisement as long as his paper continued; and that was just what Grady wanted.

MONTANA, OREGON AND WASHINGTON.

The Northern Pacific Railroad, passing through Minnesota, Dakota, Montana, Idaho, Oregon and Washington was the first line to bring the region occupied by these States, into communication with the East. Its main line and branches penetrate all sections of these States, reaching nine-tenths of the chief cities. It is the short line to Helena and Butte, Mont., Spokane Falls, Tacoma and Seattle, Wash., and Portland Ore., and the only line running through train service from the east, through the States of Montana and Washington. Pullman Sleepers and furnished Tourist Sleeping Cars are run via the Wisconsin Central and Northern Pacific, and Pullman Palace Sleeping Cars, via Chicago, Milwaukee & St. Paul and Northern Pacific, from Chicago through to the Pacific coast without change. This is the Dining Car and Yellowstone Park Route.

The large travel on the Northern Pacific line necessitated the inauguration in June 1890, of a second through train to the Pacific Coast, thus enabling this road to offer the public the advantage of two through trains daily to Montana and points in the Pacific Northwest, carrying complete service of sleeping cars, dining cars and regular day coaches. The train leaving St. Paul in the morning runs via the recently completed Air-Line of the Northern Pacific through Butte, Mont., making this the shortest line to the latter point by 120 miles.

Colonists for Washington, Oregon and British Columbia points should take no other line than the Northern Pacific, as by this line only can all portions of the State of Washington be seen. Stop-overs are allowed on second-class tickets at Spokane Falls and all points west enabling settlers to inspect the country without extra expense.

For Maps, Time Tables, and Illustrated Pamphlets or any especial information desired, address your nearest ticket agent, or CHAS. S FEE, Gen'l Pass. and Ticket Agent, St Paul, Minn.

REGENT MILLING PATENTS.

The following is a list of patents relating to Milling and Grain-handling appliances granted during the month of August, as specially reported for the U. S. MILLER, by Chas. E. Brock, Patent Attorney, Pacific Building, Washington, D. C.:

No. 433,549, Safety-alarm for elevator or other belts, J. B. Soule, Minneapolis, Minn., assignor of one-fourth to R. R. Smith and G. R. Smith, both of Duluth, Minn.

No. 433,550, Safety cut-off for grain-elevators, J. B. Soule, Minneapolis, Minn., assignor of one-fourth to R. R. Smith and G. R. Smith, both of Duluth, Minn. This consists of an elevator-belt, a pulley in contact with the same, a shaft upon which said pulley is mounted, a pivotally-supported frame affording bearings for the shaft, a spring action upon the frame to hold the pulley in contact with the belt, a weight movably sustained upon the said shaft a spring acting in opposition to the centrifugal action of the weight, a sliding collar on said shaft connected with the weight, and connections between the said sliding collar and the gate by which the gate is actuated when the weight is shifted in position by a change of speed in the pulley, substantially as described.

No. 433,575, Bolting-reel, L. Lindsay, Humboldt, Kans.

No. 433,762, Elevator, C. A. Case, New York, N. Y.

No. 433,799, Wire or cable tightener, W. Mason, Hamilton, Victoria.

No. 434,082, Elevator for grain-separators, S. B. Hart, Peoria, Ill.

No. 434,216, Dust-arrester, C. F. Verrell, Grand Rapids, Mich., assignor of one-half to F. A. Rickard and G. Barstow, same place.

Nos. 434,246, 434,247, and 434,248, Grain-separating screens, C. Closz, St. Ansgar, Iowa.

No. 434,249, Grain-separator, C. Closz, St. Ansgar, Iowa.

No. 434,467, Grain-measure, L. B. Riley, Grafton, Ill.

No. 434,514, Sack-holder, S. T. Lamb, New Albany, Ind.

No. 434,652, Drying apparatus, J. Blumer, Brooklyn, N. Y.

No. 434,654, Corn-husking machine, N. Brennan, East Boston, Mass., assignor of one-half to L. P. Lawrence, same place.

No. 434,669, Bran-packing machine, S. T. Lockwood, Chicago, Ill.

No. 434,702, Grain-weigher, C. H. Cooley and F. H. Richards, Hartford, Conn., assignors to the Pratt & Whitney Co., same place. A regulator apparatus for grain-weighers, consisting of the regulator-hopper pivotally supported on an axis about mid-way between the center of the hopper and one side thereof and having the discharge-opening at one side of the center of the hopper and substantially underneath the axis thereof and with the regulator-valve, the counter-weight set thereon at an angle of about thirty degrees above the horizontal plane of said axis, and connections operating the regulator-valve to open the same on the upward movement of the hopper, whereby the valve movement when once begun is continued with increasing effect.

No. 434,707, Roller grinding mill, T. W. Graham, Dubuque, Iowa, assignor of two-thirds to F. H. Williams, and F. Thombly, same place.

No. 434,723, Regulator for grain-weighers, F. H. Richards, Hartford, Conn., assignor to the Pratt & Whitney Co., same place.

No. 434,735, Grain-separator, F. Strobel, Marion, Ohio, assignor to the Marion Manufacturing Company, same place.

No. 434,805, Bag-holder and truck, J. H. Reckord, Belair, Md.

No. 435,057, Dust-collector, H. Farrar, Buffalo, N. Y.

No. 435,158, Pea-grader, N. G. Numsen, Baltimore, Md.

No. 435,165, Dust-collector, J. S. Ash, Canal Winchester, O., assignor of one-half to C. B. Cowan, same place.

No. 435,167, Grain-separator, H. A. Barnard, Moline, Ill., assignor to the Barnard & Leas Manufacturing Co., same place.

No. 435,258, Drying-kiln, S. W. Peregrine, Grand Rapids, Mich.

ALL persons desiring to reach the entire milling and grain trade of America, by circular or otherwise, should obtain a copy of CAWKER'S AMERICAN FLOUR MILL AND GRAIN ELEVATOR DIRECTORY FOR 1890-91.

Choice of 3 Trains

—VIA—

MONON ROUTE

—BETWEEN—

CHICAGO and INDIANAPOLIS, CINCINNATI, LOUISVILLE, LEXINGTON.

Unsurpassed Pullman Car Service.

Fast Trains. Sure Connections.

Short Route to Florida.

☞ Be sure your tickets read via Monon Route (L. N. A. & C. R'y), and your comfort is guaranteed.

For Maps, Guides, etc., address

JAMES BARKER, Gen'l Pass'r Agent, CHICAGO.

Adams Express Building.

—THE—

Cleveland, Cincinnati, Chicago & St. Louis RAILWAY.

BIG · FOUR · ROUTE

—BETWEEN—

CHICAGO, INDIANAPOLIS and CINCINNATI.

The Only Line running the Popular Buffet Sleeping Cars between

CHICAGO and CINCINNATI

The Only Line from Chicago running Solid Vestibule Trains into Central Union Depot, Cincinnati, where connection is made with Through Car Lines for Florida, avoiding all disagreeable transfers.

☞ Through Tickets via the Big Four Route can be procured at all Ticket Offices in the Northwest.

O. G. MURRAY, Traffic Manager. D. B. MARTIN, Gen'l Pass'r Agent.

CINCINNATI, O.

Grand Haven Route

D., G. H. & M. R'Y.

THE SHORT LINE TO POINTS IN

Michigan, Canada and the East

AND THE FAVORITE TOURIST ROUTE TO

Niagara Falls, Thousand Islands, Rapids of the St. Lawrence, Mountain and Seashore Resorts.

Steamers leave Milwaukee daily, except Saturdays, at 8.00 P. M., and connect the following morning with the daylight limited, which reaches Niagara Falls at 7.40 P. M., Toronto 7.30 P. M., Montreal 7.30 A. M., New York 9.40 A. M., Boston 11.40 A. M.

PARLOR AND BUFFET CARS

GRAND HAVEN to NIAGARA FALLS

SLEEPING CARS TO

NEW YORK and BOSTON

The only daily line to Muskegon, and the quickest route to the Saginaws and Bay City.

JOHN W. LOUD, Traffic Manager, DETROIT. B. C. MEDDAUGH, Western Pass'r Agent, 99 Wisconsin St., MILWAUKEE.

SCIENTIFIC AMERICAN

ESTABLISHED 1845.

Is the oldest and most popular scientific and mechanical paper published and has the largest circulation of any paper of its class in the world. Fully illustrated. Best class of Wood Engravings. Published weekly. Send for specimen copy. Price $3 a year. Four months' trial, $1. MUNN & CO., PUBLISHERS, 361 Broadway, N.Y.

ARCHITECTS & BUILDERS Edition of Scientific American.

A great success. Each issue contains colored lithographic plates of country and city residences or public buildings. Numerous engravings and full plans and specifications for the use of such as contemplate building. Price $2.50 a year, 25 cts. a copy. MUNN & CO., PUBLISHERS.

PATENTS may be secured by applying to MUNN & Co., who have had over 40 years' experience and have made over 100,000 applications for American and Foreign patents. Send for Handbook. Correspondence strictly confidential.

TRADE MARKS.

In case your mark is not registered in the Patent Office, apply to MUNN & Co., and procure immediate protection. Send for Handbook.

COPYRIGHTS for books, charts, maps, etc. quickly procured. Address

MUNN & CO., Patent Solicitors, GENERAL OFFICE: 361 BROADWAY, N. Y

THE CHICAGO MILWAUKEE AND ST. PAUL RAILWAY CO.

Fast Mail Line with Electric Lighted and Steam Heated, Vestibuled Trains between Chicago, Milwaukee, St. Paul and Minneapolis.

Trans-Continental Route with Electric Lighted and Steam Heated Vestibuled Trains between Chicago and Council Bluffs, Omaha or St. Paul and the Pacific Coast.

Great National Route between Chicago, Kansas City and St. Joseph, Mo.

5700 Miles of Road reaching all principal points in Illinois, Wisconsin, Minnesota, Iowa, Missouri, South Dakota and North Dakota.

For Maps, Time Tables, rates of passage and freight, etc., apply to the nearest station agent of the CHICAGO, MILWAUKEE & ST. PAUL RAILWAY, or to any Railroad Agent anywhere in the World.

ROSWELL MILLER, General Manager. A. V. H. CARPENTER, Gen'l Pass. and Tkt. Agt.

☞ For information in reference to Lands and Towns owned by the CHICAGO, MILWAUKEE & ST. PAUL RAILWAY COMPANY, write to H. G. HAUGAN, Land Commissioner, Milwaukee, Wisconsin.

THE CHICAGO AND NORTH-WESTERN RAILWAY.

Affords unrivaled facilities for transit between the most important cities and towns in Illinois, Iowa, Wisconsin, Northern Michigan, Minnesota, North and South Dakota, Nebraska and Wyoming.

The train service is carefully adjusted to meet the requirements of through and local travel and includes

Fast Vestibuled Trains

—OF—

Dining Cars, Sleeping Cars and Day Coaches

Running Solid between Chicago and

ST. PAUL, MINNEAPOLIS, COUNCIL BLUFFS, OMAHA, DENVER and PORTLAND, ORE.

Pullman and Wagner Sleepers

CHICAGO to SAN FRANCISCO

WITHOUT CHANGE.

COLONIST SLEEPERS

CHICAGO TO PORTLAND, ORE. and SAN FRANCISCO.

FREE RECLINING CHAIR CARS

CHICAGO TO DENVER & PORTLAND, ORE.

Via Council Bluffs and Omaha.

For time of trains, tickets and all information, apply to Station Agents of the Chicago & North-Western Railway, or to the General Passenger Agent at Chicago.

W. H. NEWMAN, 3d Vice-Pres. J. M. WHITMAN, Gen. Manager. E. P. WILSON, Gen. Pass. Agt.

Milwaukee & Northern R. R.

SHORT LINE

—TO—

Ontonagon, Marquette, Negaunee, Ishpeming, Hancock, Houghton Champion, Republic, Iron Mountain, Menominee, Mich.

Marinette, Oconto, Green Bay, Depere, Neenah, Menasha, Appleton, Wis.

THE TABLE OF EXPRESS TRAINS.

STATIONS.	DEPART.	ARRIVE.
Champion, Republic, Iron Mountain,	11:05 P. M.	*3:30 A. M.
	†2:00 A. M.	
	6:30 A. M.	6:55 P. M.
Menominee, Marinette, Oconto, Green Bay, DePere,	11:05 P. M.	*3:30 A. M.
	†2:00 A. M.	
	6:30 A. M.	6:55 P. M.
	2:30 P. M.	11:20 A. M.
Appleton, Menasha, Neenah	‡11:05 P. M.	
	†2:00 A. M.	
	6:30 A. M.	6:55 P. M.
	2:30 P. M.	11:20 A. M.

*Daily. †Monday only. ‡Except Saturday and Sunday. All other trains daily except Sunday.

Pullman Sleeping Cars are run on all night trains, and are ready for occupancy at 9:00 P. M.

New Passenger Station, Fourth Ward Park.

C. F. DUTTON, General Manager. W. B. SHEARDOWN, Gen'l Pass'r & Tkt. Agt.

THE WISCONSIN CENTRAL LINES

NORTHERN PACIFIC RAILROAD CO. LESSEE

RUN

Fast Trains with Pullman Vestibuled Drawing Room Sleepers, Dining Cars and Coaches of latest design, between **Chicago** and **Milwaukee** and **St. Paul** and **Minneapolis.**

Fast Trains with Pullman Vestibuled Drawing Room Sleepers, Dining Cars and Coaches of latest design, between **Chicago** and **Milwaukee** and **Ashland** and **Duluth.**

Through Pullman Vestibuled Drawing Room and Colonist Sleepers via the **Northern Pacific Railroad** between **Chicago** and **Portland, Ore.**

Convenient Trains to and from Eastern, Western, Northern and Central Wisconsin points, affording unequaled service to and from **Waukesha, Fond du Lac, Oshkosh, Neenah, Menasha, Chippewa Falls, Eau Claire, Hurley, Wis., and Ironwood and Bessemer, Mich.**

For tickets, sleeping car reservations, time tables and other information, apply to Agents of the line, or to Ticket Agents anywhere in the United States or Canada.

S. R. AINSLIE, General Manager, - Milwaukee, Wis.
J. M. HANNAFORD, Gen'l Traffic Manager, St. Paul, Minn.
H. C. BARLOW, Traffic Manager, - - Chicago, Ill.
LOUIS ECKSTEIN, Gen'l Pass'r & Ticket Agt, Chicago, Ill.

ASHLAND M.L.S.&W.RY. ROUTE

THE MILWAUKEE, LAKE SHORE & WESTERN R'Y

Through Sleeping and Parlor Car Line

—WITH—

FAST TRAINS

CHICAGO AND MILWAUKEE

—TO—

Appleton, Wausau and Ashland

THE GOGEBIC, PENOKEE AND MONTREAL IRON AND MINERAL RANGES.

Hurley, Ironwood, Bessemer and Wakefield

The Manufacturing Centers and Lumbering Districts of Central and Northern Wisconsin.

SHEBOYGAN, MANITOWOC, KAUKAUNA, APPLETON, WAUSAU, ANTIGO, EAGLE RIVER AND RHINELANDER.

The only line reaching the celebrated fishing resorts of Northern Wisconsin and Michigan.

Gogebic, Tomahawk and Pelican Lakes, Rhinelander, Eagle Waters, Twin Lakes, Lake Vieux Desert, Watersmeet.

The ONTONAGON, BRULE and other Trout Streams, Noted for their excellent Muskalonge, Bass, Pike, Pickerel and Trout fishing.

DIRECT LINE

Via New London June. and G. B. W. & St P. R. R.

—FOR—

SEYMOUR, GRAND RAPIDS, AND STEVENS POINT.

Via ASHLAND and NORTHERN PACIFIC R. R.

—FOR—

SUPERIOR, DULUTH,

PACIFIC COAST AND INTERMEDIATE POINTS.

Guide Books, Maps, Time Cards and full information furnished on application to the Gen'l Pass. Agt.

Chas. L. Ryder, Gen'l Agt. A. W. Russell, City P. & T. Agt. } 197 Clark Street, CHICAGO.

Milwaukee City Office, 95 Wisconsin Street.

H. F. WHITCOMB, General Manager. ERNEST VLIET, Gen. Pass. Agt.

MILWAUKEE, WIS.

Queen & Crescent ROUTE

94 MILES THE SHORTEST, 8 HOURS THE QUICKEST,

CINCINNATI TO NEW ORLEANS

Time, 27 Hours.

Entire Trains, Baggage Car, Day Coaches and Sleepers run through without change.

110 MILES THE SHORTEST, 7 HOURS THE QUICKEST,

CINCINNATI to JACKSONVILLE, Fla.

Time, 28 Hours.

Through Sleepers without change. The Short Line between Cincinnati and

Lexington,	Ky.,	Time,	2½ Hours.
Knoxville,	Tenn.,	"	12 "
Asheville,	N. C.,	"	17 "
Chattanooga,	Tenn.,	"	11 "
Atlanta,	Ga.,	"	15 "
Birmingham,	Ala.,	"	16 "

Direct Connections at New Orleans, and Shreveport, for Texas, Mexico and California.

Trains leave Central Union Depot, Cincinnati, crossing the Famous High Bridge of Kentucky, and rounding the base of Lookout Mountain.

Over One Million Acres of Land in Alabama, the Future Great State of the South, subject to pre-emption. Unsurpassed Climate.

For Rates, Maps, etc., address,

C. S. HENRY, Traveling Passenger Agent, 193 Clark St., Chicago, Ill.

C. C. HARVEY, Vice Pres't. CINCINNATI, OHIO. D. G. EDWARDS, G. P. & T. A.

Goodrich Steamers

ON REGULAR TIME

LEAVE MILWAUKEE FOR

Chicago daily, Saturdays excepted, at	7:00 P. M.
Racine daily, Saturdays excepted, at	7:00 P. M.
Sheboygan daily, Sundays and Mondays excepted, at	7:00 A. M.
Manitowoc daily, Sundays and Mondays excepted, at	7:00 A. M.
Sheboygan on Sundays and Mondays at	7:00 P. M.
Manitowoc on Suudays and Mondays at	7:00 P. M.
Kewaunee and Ahnapee Saturdays at	7:00 A. M.

THOMAS FORBES, Passenger Agent. G. HURSON, Sec. and G. T. M.

EXPORTING millers should write to the Riverside Printing Co., Milwaukee, Wis., for the best Flour Cable Code ever published. There are more copies of this Code in use than of ALL other flour codes published. It is simple and accurate. It is called "The Riverside Flour Cable Code."